4th Stac

MAY 1961
50 CENTS

FARM CHEMICALS

DETROIT PUBLIC LIBRARY
GENERAL INFORMATION

The management magazine of the industry

Exclusive this month:

Scale weights and your profits

Production methods:

New trends in pesticide formulation

Special reports:

New frontiers in aquatic weed control

Preliminary report

Consumption of fertilizers and primary plant nutrients

Detroit Public Library
General Information, Per.
5201 Woodward Avenue
Detroit 2, Michigan
PSH

"Len" Gopp explains the "blitz"...

How to make fertilizer sales today

"Always efficient and dependable" . . . says J. E. Fortner, President of Citrus Culture Corporation referring to their many years of experience with PAYLOADER tractor-shovels. "At our new plant we now have three modern H-25 PAYLOADER units. Their greater [2,500-lb.] capacity, faster cycles and easier operation give us more productive capacity so that we can render better, faster service to our customers during the peak season."

Citrus Culture Corporation of Mount Dora, Florida, is a producer of custom blended fertilizers particularly for the citrus and vegetable growers in the area. It has used PAYLOADER tractor-shovels for many years to unload box cars, charge elevators and feed baggers.

Their present PAYLOADER equipment consists of three model H-25 units that feature power-shift transmissions, power-steering and other improvements. The oldest of these has operated 2,400 hours and has only required routine maintenance and adjustments. They credit this fine record not only to superior basic design but also to the extra protection against dust and dirt built into the machine — the special air filtering and oil filtering plus the many grease and oil seals provided.

Your Hough Distributor wants to show you what the H-25 or one of the larger PAYLOADER models can do on your bulk-handling work. See him soon, or return the coupon.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER, PAYLOMATIC and PAY are registered trademark names of The Frank G. Hough Co.

THE FRANK G. HOUGH CO., 704 Sunnyside Ave., Libertyville, Ill. 5-A-1

Send "Industrial Material Handling from A to Z"

NAME
TITLE
COMPANY
STREET
CITY STATE

Mr. Cecil E. Carroll
President and Owner

Mr. Mendell Johnson
Superintendent

Carroll Fertilizer Company, Dublin, Georgia

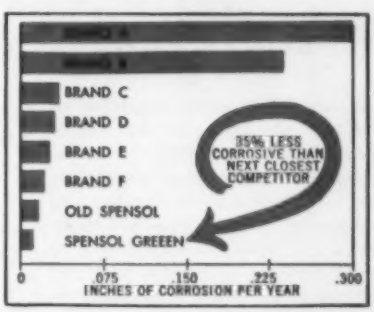
A veteran fertilizer firm, Carroll Fertilizer Company began selling to Georgia farmers in 1927. The building shown above houses their facilities for manufacturing popular grades of mixed fertilizer such as 4-12-12 and 5-10-5.

34-Year-Old Carroll Fertilizer Company Uses Non-Corrosive SPENSOL GREEEN* Solutions

Since beginning business as a fertilizer dealer 34 years ago, Carroll Fertilizer Company has expanded its facilities to include manufacturing, storage, sales, and application. About 75% of their MO-CROP brand mixed fertilizers production is used on row crops and 25% goes on pastures. Carroll Fertilizer Company also features Spencer's popular URA-GREEEN solution as supplemental nitrogen for direct application.

Manufacturers of long experience, these experts know the importance of corrosion control. They protect their valuable production and storage equipment by specifying genuine SPENSOL GREEEN Ammoniating Solutions. Thanks to its advanced corrosion inhibitor, SPENSOL GREEEN gives you far greater corrosion protection than any other competitive solution (see chart at right) . . . yet it costs you nothing extra!

Why risk costly corrosion damage? Extend the life of your equipment beginning now by making your next order SPENSOL GREEEN. Contact your Spencer representative now for prompt delivery!



See how you can cut costly corrosion damage when you switch to genuine SPENSOL GREEEN—as proven by the laboratory test results shown above.

*A registered trademark of Spencer Chemical Company.

Insist on **SPENSOL GREEEN**

NON-CORROSIVE AMMONIATING SOLUTIONS

SPENCER®

Spencer Chemical Company
Dwight Bldg., Kansas City, Missouri

Sales Offices: Atlanta, Ga., Chicago, Ill., Memphis, Tenn., Omaha, Nebr., Kansas City, Mo.
Works: Pittsburg, Kans., Henderson, Ky., Vicksburg, Miss.

E. G. K. Meister
PUBLISHER

R. T. Meister
EDITORIAL DIRECTOR

Gordon L. Berg
EDITOR

Phyllis Marron
ASSOCIATE EDITOR

Charlotte Sine
ASSOCIATE EDITOR

John Harms
WASHINGTON BUREAU CHIEF

Edward L. Meister
ADVERTISING DIRECTOR

J. S. Bender
PRODUCTION MANAGER

E. P. Jeanguenat
CIRCULATION MANAGER

ADVERTISING OFFICES

Chicago 1
Al Zilenziger
333 N. Michigan Avenue
STate 2-7128

Los Angeles 4
Townsend, Millsap & Co.
139 S. Vermont Avenue
DUnkirk 3-1211

New York 17
Rod Zilenziger
415 Lexington Avenue
MUrray Hill 7-1488

San Francisco 4
Townsend, Millsap & Co.
110 Sutter Street
SUtter 1-7971

BPA
MEMBER BUSINESS PUBLICATIONS AUDIT

The national business magazine for the fertilizer and pesticide industries, FARM CHEMICALS, serves primarily those persons responsible for management, marketing and production. It has a qualified circulation for selected executive and supervisory persons within specified segments of these industries, as well as in certain closely allied fields. Subscription rates to all others are: in the U.S., its possessions, Canada, Cuba and Panama: $6.00; in other countries: $7.50. Current issue 50 cents. Back issues $1.00. (Current issues become back copies on the 5th of the month following publication.) Established in 1894 as *The American Fertilizer*.

©American Fruit Grower Publishing Co.

Published monthly by
American Fruit Grower Publishing Co.
37841 Euclid Avenue
Willoughby, Ohio
WHitehall 2-2000

Accepted as controlled circulation publication at Ashland, Ohio

FARM CHEMICALS

Vol. 124 No. 5 May 1961

MARKETING

12 How to Make Sales Today

MERCHANDISING AIDS AND PROMOTION

20 What the Manufacturer Can Do for the Dealer
Part IV—Selecting Training Content *F. E. Hartzler*

MATERIALS HANDLING AND CUSTOM APPLICATION

22 Your Scale Weights . . . and Your Profits *Arthur Sanders*
34 New Packaging for the Age of Automation

SPECIAL REPORTS

14 Preliminary Report on Consumption of Commercial Fertilizers and Primary Plant Nutrients in the United States, year ended June 30, 1960 *Walter Scholl, M. M. Davis and C. A. Wilker*
28 California Fertilizer Conference Attracts 225 to Pomona
36 The Pesticide Outlook for '61 *Wayne Yoder*

PRODUCTION METHODS

32 New Trends in Pesticide Formulation

TECHNICAL REVIEW

40 Low Toxicity Herbicide Opens "New Frontiers" in Aquatic Weed Control *Harold J. Miller*

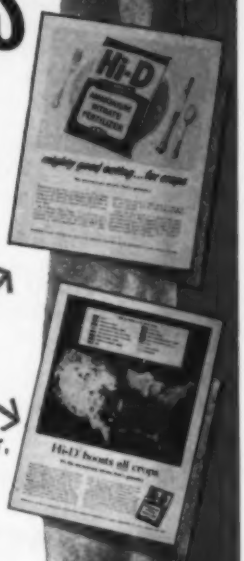
DEPARTMENTS

6 Letters
8 Washington Viewpoint
10 What's Doing in the Industry
38 Patent Reviews *Melvin Nord*
44 News of the Industry
46 Calendar
46 People
48 Chemicals
50 Government
50 Suppliers' Briefs
52 Associations and Meetings
53 Reader Service
54 New and Noteworthy
58 Editorial

THE COVER STORY

Few companies enter the sales season with as much fanfare as International Minerals & Chemical Corporation. They went into orbit several years ago, but even before this IMC was known for its "blitz." "Len" Gopp, vice president in charge of sales, was called upon to explain this program of help for IMC customers. You'll also get some exclusive information about their celebrated fully-automated order handling system on pages 12-13 of this issue.

A BAGFUL OF WAYS TO BOOST Hi-D® SALES



IN '61 The idea of Hi-D is catching on. More farmers, more ranchers, more growers are using ammonium nitrate in granular form—using Hi-D as a supplement to your mixed fertilizers. Read how CSC is spreading the news about Hi-D and backing up your own sales efforts throughout '61.

MAGAZINES feature these informative ads, explaining the many advantages of Hi-D.

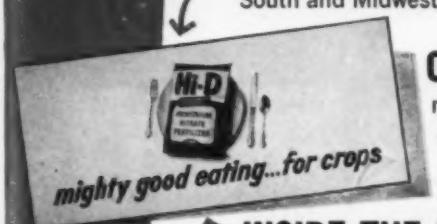
In full color in Progressive Farmer, Farm & Ranch and Successful Farming.

And in black and white in Florida Grower & Rancher, Prairie Farmer, Citrus & Vegetable Grower and Rice Journal.

TV SPOTS on farm programs of 18 stations demonstrate the free-flowing action of Hi-D.

RADIO SPOTS on 75 stations are a frequent nudge to farmer's memory.

BILLBOARDS in 879 high-traffic locations throughout South and Midwest enlarge 'Mighty Good Eating' theme.



OUTSIDE THE STORE Attractive metal sign and Hi-D clock-type thermometer (attention guaranteed!) bring the Hi-D buyer to your store.

INSIDE THE STORE Window streamers echo theme of 'Mighty Good Eating'; packages of samples, product folder and counter displays keep customers thinking Hi-D.

CSC

COMMERCIAL SOLVENTS CORPORATION, AGRICULTURAL CHEMICALS DEPARTMENT, ATLANTA, SHREVEPORT, ST. LOUIS, CHICAGO, NEW YORK

LETTERS

READERS WRITE FOR REPRINTS

San Francisco, Calif.

Please forward, together with your invoice if a charge is made, 25 copies of "Knowledge Makes the Difference"—reprinted from FARM CHEMICALS, June 1960.

Very truly yours,
JAMES C. TAYLOR
Meal Department
PACIFIC VEGETABLE OIL CORP.

Chicago, Illinois

We have had some requests already for reprints of the article "Farmers Respond to Extension-Industry Cooperation" by Ryder and Rogers which appeared on pages 32 to 34 of the March issue of FARM CHEMICALS. Might we have 100 reprints of this article, so that we can make distribution to those who ask for it. Bob Beacher of our Southern region would like to have 25 copies . . .

Sincerely,
ZENAS H. BEERS
Midwest Regional Director
NATIONAL PLANT FOOD INSTITUTE

Mulberry, Fla.

Would it be possible for our library to procure a reprint of an article that was published in your FARM CHEMICALS, November, 1959? The title of the article is, "Estimating Reagent Acid Requirements in Superphosphate Production" by E. J. Fox and W. A. Jackson . . .

ADELE L. OLDENBURG
Librarian
INTERNATIONAL MINERALS & CHEMICAL CORP.
Research Engineering & Development Div.

FISHMEAL AS FERTILIZER

New York City

We would appreciate any information you can give us concerning the following:

1. Is Fishmeal used as an ingredient of fertilizer?
2. How many pounds are used per year?
3. Which firms would incorporate the fishmeal into the fertilizer?
4. Are there any special requirements that the fishmeal must meet such as nitrogen content?

Very truly yours,
K. LIPPEL
SHEPARD DIVISION
SAMINCORP

AAFCO official definition in our FARM CHEMICALS HANDBOOK *is: "Fish Tankage, fish scrap, dry ground fish, fish meal fertilizer grade, is the dried ground product derived from rendered or unrendered fish."*

USDA's report on "Consumption of Commercial Fertilizers and Primary Plant Nutrients, year ended June 30, 1959," which appeared in our October 1960 issue, shows that 1,714 tons of fish scrap, meal and emulsions were sold that fertilizer year.

As for specific requirements that fishmeal must meet such as nitrogen content, I'd say this depended upon whatever state regulations there may be on this. We carry summaries of plant food laws for each state in our Handbook, which I think would come in handy for you. Each state has a control official listed under the state listing. For more specific information you could write to him.—EDITOR.

Spencerville, Ohio

Kindly send us information regarding your monthly magazine. We would like to receive this magazine and would appreciate hearing from you in the near future.

Respectfully yours,
R. R. MCBRIDE
President
BETTER GROW INC.

Tyler Leads the Way!

a sensational **BREAK-THROUGH** in design and engineering!

DO-IT-YOURSELF

fertilizing equipment which you can rent to your customers . . . spreads up to an acre per minute.

- Hauls and spreads fertilizer quickly and efficiently
- 45 foot spread pattern
- Investment in this machine will move up to 600% more fertilizer

TYLER F-2 SPREADER*

*PATENT PENDING

distributor and dealer inquiries invited!

Also a complete line of truck bulk spreaders

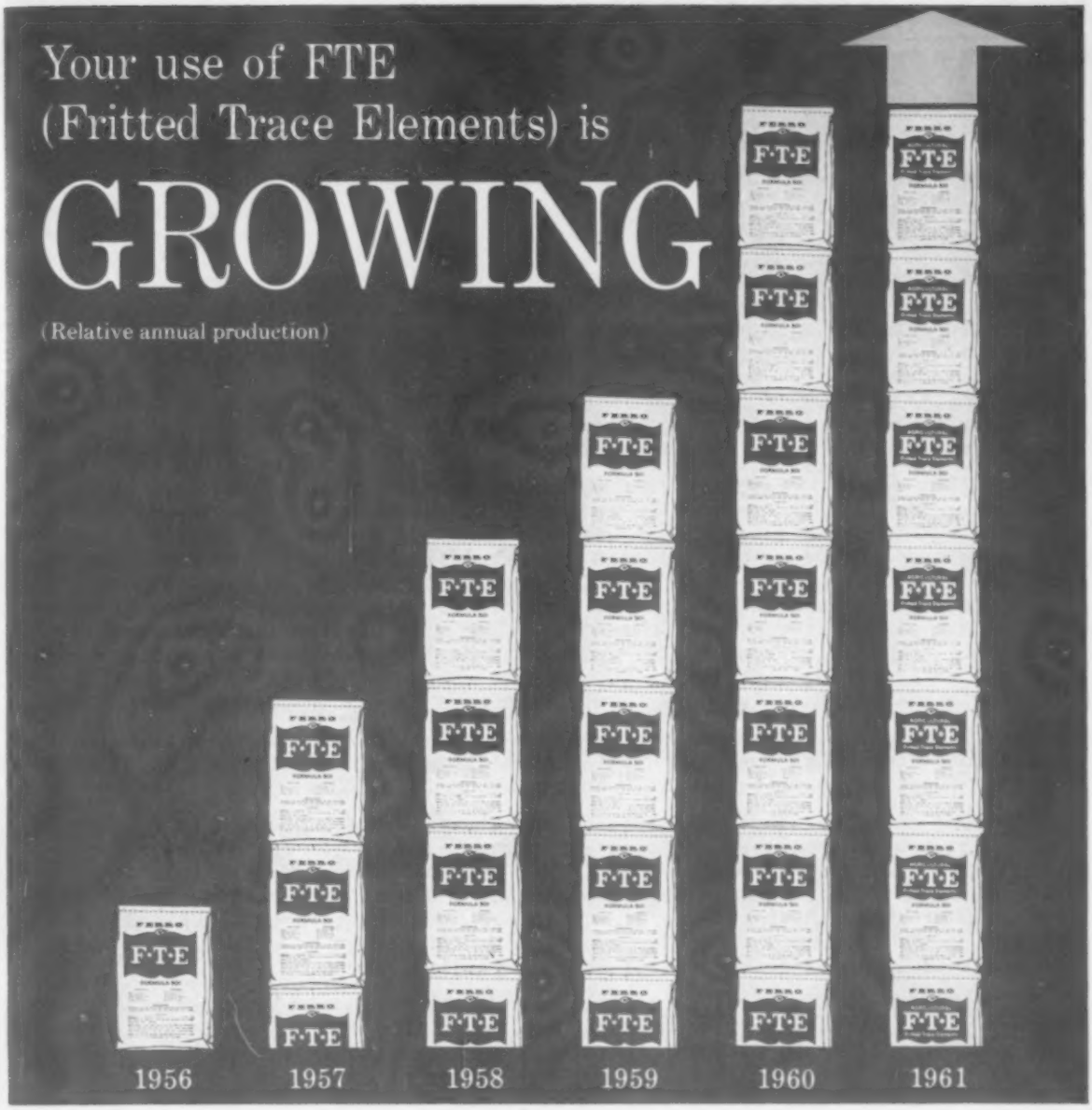
SPECIFICATIONS	
Body Weight	1500 lbs.
Hopper Dimensions	60" x 84"
Wheel Track	74 inches
Axle Rating	4000# each axle
Type Axle	Tandem Torsion Spring
Fans	Angled Twin 19 in. Dia.
Wheel Bearing	Sealed Timkin Bearing
Capacity	2½ Ton
With Body Extension	19 in. 4 Ton
Spread Pattern	Approx. 45 Ft.
Spread Capacity Pr. Hr.	30-60 Acres
Field Speeds	
6 M.P.H.	30 Acres Pr. Hr.
12 M.P.H.	60 Acres Pr. Hr.
18 M.P.H.	90 Acres Pr. Hr.
Highway Speeds	up to 60 M.P.H.

Tyler MANUFACTURING COMPANY
East Highway 12 Benson, Minn.
Phone Viking 2-8581

Your use of FTE
(Fritted Trace Elements) is

GROWING

(Relative annual production)



Controlled Solubility makes it different...*better*

Where trace elements are needed, FTE is consistently winning new friends. As a source of *boron*...or *manganese*... or *iron*, *zinc*, *copper* and *molybdenum* it is unsurpassed. Combining all *six* in a single product, it produces excellent results—often with no more than 1% mixed into good fertilizers.

Unlike soluble salts that leach out in heavy rains, or become fixed in the soil under certain conditions, FTE releases the nutrients as needed. "Fritting" makes possible *controlled*, *predetermined solubility*. This, in turn, makes fertilizers more productive, much more predictable.

While *two* standard formulas are available, and others are being developed for specific areas of the country, all can be *safely used anywhere*, and *on any crops*, simplifying manufacturing and marketing for our fertilizer customers.

If you are not fully informed about FTE, let us tell you about it. Better yet, *try* FTE in your fertilizers this season. We'll be happy to work with you.

FERRO

FERRO CORPORATION *Agricultural Division*

4150 East 56 Street • Cleveland 5, Ohio

WASHINGTON VIEWPOINT

FC

- *Fertilizer prices should hold up well because of improved farm income.*
- *Small Business Administration relaxes loans procedures in rural districts.*

You can count on bumper farm production again in the new crop season. Some small cutbacks are expected as a result of the new feed grain law — true. But increases in the production of soybeans, dairy products, livestock, potatoes and smaller crops are expected to almost balance off the cuts. The thing to remember is that the new farm programmers are not out to cut back total production. They want more fats and oils, which are in demand, and a few holdbacks on wheat and feed grain production for a couple years until demand catches up with supply.

Overall production, counting both non-supported and supported crops, accordingly won't be a new record-buster. BUT — officials are pointing out, the slight slowdown of ever-increasing crop records is coming in a new record year as far as farm income is concerned.

What this means to industry is a softening of the cost-price squeeze on the producer. The big-pick-up in farm income lifts the economic pressure on the farmer that forces him to pull in his belt on production needs. Over and above direct higher income, credit increases of a minimum $100 millions have been made available to enable the farmer to bring production methods up to date.

Top government economists consider much bigger farm income already in the bag at the mid-year point. By year's end, they see a $2 billion increase over last year. Most of the increase is NOT coming out of the government's big piggy bank, but out of higher support levels for some 10 crops. It's part of the Administration's plan to make the buyer contribute more toward production costs.

Fertilizer prices should hold up well as a result of the improved farm income situation. When USDA chemical supplies specialists warn of possible tight fertilizer supplies, prices look even better.

Planting cutbacks won't be severe as far as the overall picture is concerned. Under the most successful participation possible — 70 per cent — acres taken out of production would be less than 5 per cent of the total acres planted nationally to all crops. But this is bullish. Based on more real cutbacks of corn and sorghum, the most land likely to be taken out of production would be 15 million acres. But increased production and plantings of other crops would reduce this to an effective cut of about 10 million acres.

Corn growers for the most part still aim for the highest yields possible, although yields are supposed to be held down under the new feed grain law. With the exception of grain sorghum, there will be every inducement to make greater use of farm production chemicals under the higher price supports offered on the major crops, according to those close to farmer planting intentions.

Small Business Administration has relaxed its loans procedures for small business operations of every kind in areas where feed and fertilizer dealers are most likely to want to expand. That is, in rural districts. Big cities are not interested.

Where formerly it took months to get direct loans over $20,000 approved by the SBA's Washington office, the job can now be done in as little as three weeks. The answer: SBA has increased authorization at its 15 regional offices for both direct loans and bank-participation borrowing. Direct loans up to $50,000 now are possible at the field level. Loans up to $100,000 are possible with 10 per cent bank participation and $150,000 if the bank will lend 25 per cent. Lower interest rates are also possible if the bank will lower its rates proportionately.

$1.2 billions for water pollution is considered a near certainty starting the new fiscal year July 1. Legislation which would have doubled the Federal aid portion to States was vetoed by the White House. This session, the White House has in effect told Congress to produce the legislation again and it will be signed. Some areas have been making it tough for chemical plants to expand or locate new operations because the state couldn't or wouldn't kick in with enough funds to control sewage.

NOW ON STREAM!

General Chemical's New E. St. Louis Wet Process Phosphoric Acid Plant

The green acid from General Chemical's latest design wet process phosphoric acid plant is *really* green! It runs 75% H_3PO_4 consistently—or 54.3% P_2O_5. It is cleaner, with lower solids content, and therefore easier for you to use and handle.

For information on this new greener phosphoric acid—and how it can bring you savings in your own operations—call your nearest General Chemical office.

Basic to America's Progress

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N.Y.

WHAT'S DOING IN THE INDUSTRY

F
C

Plans for a pilot plant and test wells for solution mining of potash have been announced jointly by Pittsburgh Plate Glass Co. President David G. Hill and Armour and Company Board Chairman William Wood Prince. Drilling has already begun on property 18 miles east of Moosejaw, Sask., Canada, to tap potash deposits underlying that area. The experimental unit will cost about $1 million. Prince and Hill said that after completion of successful pilot operations, a joint company to produce muriate of potash in a multimillion dollar commercial plant in Canada will be formed by Armour and PPG.

It was encouraging to see the heading "Use of Weed Killers Hailed" in a recent edition of the Los Angeles Times. The item reported that chemical weed killers used by the county road department saved Los Angeles County $5 million during the last ten years. Supervisor Chace, chairman of the Board of Supervisors road committee, said the program makes traffic signs more visible, reduces the fire hazard from roadside brush and eliminates the need to repair pavement damaged by plant growth.

Steele Wright, president of Texas Farm Products Co., wrote a number of Congressmen and the Senators from Texas regarding President Kennedy's new highway tax plan, which he said "certainly comes as a shock to us and our industry . . . The effect of such a tax would be a severe blow to our industry and an increase in cost to the farmer for his feed and fertilizer supplies . . . It is certainly apparent that the interstate highway system often does not serve people who operate on a regional basis as we do."

Completion of a new pesticide formulating plant at South Haven, Mich., is reported by Ralph C. Gaines, regional manager of Niagara Chemical Div., Food Machinery and Chemical Corp. Containing some 18,000 square feet of production and warehouse space, the plant replaces a smaller unit which had been leased by Niagara. It will serve Michigan, northern Indiana and Ohio.

New facilities valued at more than half a million dollars have been erected at W. R. Grace & Co.'s central research facility in Clarksville, Md., to handle the expanded activities of the New Product Development and Agricultural Chemicals Research Departments. Included is a 6,000 square foot New Product Development building and an all-aluminum greenhouse.

R. H. McGough has been elected president of Western States Chemical Co. He is succeeded as general manager of agricultural chemical sales at Collier Carbon and Chemical Corp. by John A. Foster.

A new family of quaternary ammonium compounds, the phenacridiniums, show marked effectiveness under lab and greenhouse conditions as protectants against downy mildew of lima beans, USDA reports. The compounds were synthesized and studied for clinical use by industry and appeared promising as preoperative and laundry sterilants in hospitals. But medical adaptation hasn't been exploited because of the indelible yellow stain left when the compounds are used. USDA scientists say the staining characteristic isn't objectionable from concentrations used for plant disease control.

The parent compound—phenacridane chloride (9-(p-n-hexyloxyphenyl)-10-methylacridinium chloride)—and several close relatives were from four to eight times more effective in laboratory tests than one of the commercial fungicides used against downy mildew, USDA says. Effectiveness against other crop diseases, such as anthracnose of snap beans, now is being studied.

To what lengths will a salesman go in his concern for his customer's farm problems? Stauffer Chemical Salesman Bill Holt found Ben and Harry Hughes, customers in his Montana territory, concerned about the condition of the hoofs of their old mare when he called on them last summer. The animal was used to cultivate between corn rows and other crops where it is difficult to get a tractor. Bill decided to do Ben and Harry a favor and trim the old mare's feet. She was a "spoiled gal that kicked you to start," a Stauffer News Letter reports, "and when you got her feet up, lay all her weight on you. But he got her trimmed up. Ben and Harry were tickled. Bill was tired. All went home happy. And a new chapter in Stauffer service was written."

Designed to Serve & Sell!

bags by Chase

Your package is the "picture" of your product to your customers and prospects. To make the picture attractive Chase's Art Department is ready to help you design a brand to achieve just the right effect for your purpose. Skilled color printing craftsmen follow through to give you a bag that does a top selling job.

And to make your bag serve—longer and better—we insist on the finest bag materials available, bought in the open market and thus not limited to a single source. Our "kraftsmen" turn these into the toughest bags you ever put feed, seed, fertilizer, chemicals—or anything—into.

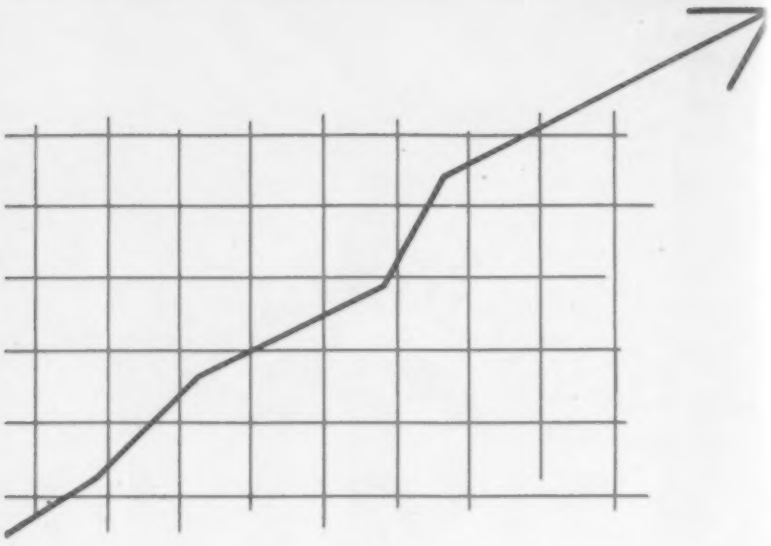
If you want bags that are designed to sell as well as made to serve, call your Chase Man. Or write us.

CHASE BAG COMPANY
355 Lexington Avenue · New York 17, N.Y.

**A Chase bag will make your product a Very Important Package.*

MULTIWALLS • TEXTILE • PLASTIC AND LAMINATED BAGS • CONSUMER-SIZE PAPER BAGS AND OTHER PACKAGING MATERIALS

HOW TO MAKE SALES TODAY!



With a 10 per cent increase in total fertilizer sales being predicted, "Len" Gopp shows how IMC and their customers will capture "their share" of the growing market.

THE sales "blitz" hit all regions of Agriculture USA recently when the *production phase* of International Minerals & Chemical Corporation's full-range customer service program went into high gear.

L. W. Gopp, IMC's hard-driving vice president in charge of sales, told FARM CHEMICALS at press-time that this season "looks very good for us."

"We have predicted a 10 per cent increase in total fertilizer sales in the U.S. and of course we expect to maintain our share."

How does IMC intend to do it? *New* ideas, of course. *Like the new feature introduced this year—their fully automated order handling system* (discussed later in this article). And some *old* ideas, too. *Like the sales "blitz"—a concentrated form of canvassing prospective customers.*

NO TWO "BLITZES" ALIKE

While the blitz is an established, effective technique, no two blitzes are exactly alike! It's up to each individual IMC customer to come up with his own program—based on IMC's recommendations.

It differs from regular programs—and there are many of them at IMC—in only one important aspect. *Intensity!*

For several weeks now, manufacturers have been making maximum use of IMC's marketing assistance in the form of a kit, "How to Make Sales Today," which oulines the "blitz" program.

HOW THE SALES BLITZ WORKS

Several salesmen, perhaps the entire sales force, are brought into a confined market area. Often, inplant personnel supplement the sales force. The plan is to contact all consumer prospects in the area in a "*quick*," systematic manner. Usually the entire job is accomplished in a week or two.

There are four major objectives for any sales "blitz" program:

(1) to improve the company position among prime, near-by consumers and increase their knowledge of the company's products and services offered locally.

(2) to concentrate sales as close as possible to the company office—the area in which it is most economical to do business.

(3) to locate key consumers who are being sold direct by competitors.

(4) to inspire dealers to more aggressive sales action by giving them extra sales support.

The sales "blitz" is conducted by canvassers calling on farmers or other purchasers of fertilizers within a given marketing area. The operation should be conducted as quickly as possible. As a rule of thumb, the factor determining the number of prospects reached will be the number of calls the canvasser can make in a day, the number of canvassers employed and the estimated duration of your "blitz." These factors help preplan the approximate radius to be covered.

The people chosen to be canvassers are highly important. Whenever possible, trained professional sales people are used. However, in some cases supervisory help in the plant is used.

ENTHUSIASM IS THE KEY

In order to properly stimulate these people and reward them for the extra time and effort they are called upon to give to this project, it is important that their attitude toward it be positive and enthusiastic. Enthusiasm is effectively stimulated by a sales incentive plan.

One of the most important factors in a successful sales "blitz" is the planning that goes into it. Often, it's the most important ingredient of the entire campaign. Here are major points to be considered:

The "blitz" market should be within 20 to 25 miles of the plant. This is the *profitable* area—the area where service and proximity mean the most.

If the company desires to "hit" prospective customers according to their income-level, the size of farms is often a good gage. For example, a company may wish to visit farms no smaller than 160 acres. Information on acreage and location of farms can usually be found at the county courthouse by going over the tax records.

It has been determined that one man cannot average more than twelve calls per day when using the "blitz" procedure. Operating on a six-day week basis, he can call on seventy-two farmers a week.

The number of farms (over the desired minimum acreage) in the marketing area you want to "blitz"—and the duration of your "blitz" (one or two weeks)—will determine the exact number of men needed.

Perhaps, the sales force will be able to supply the entire "blitz" force. Most likely, though, it will be necessary to recruit from the office or plant personnel. Since the first call is primarily a canvassing job—and it will be followed up by regular salesmen or a dealer salesman—non-sales personnel should not diminish its effect.

SELECTING "BLITZ" MATERIAL

In advance of the "blitz" here are the materials that "blitz-men" need in order to do an effective job:

(1) Postcard mailer—notifying the farmer of the intended call.

(2) Price card—for sales direct to farmers.

(3) Price card showing dealer's price to customers.

(4) List of dealers' names and addresses.

(5) Specific geographical area for each of the "blitz-men" to cover.

(6) Up-to-date sample kit of products (presuming that such a thing is already in existence).

(7) Literature describing products (assuming such is already in existence).

(8) Testimonials from customers.

(9) Low cost give-away (meat thermometer, tape measure, butter spreader; something of use to farmer's wife).

(10) Advertising mats for dealer tie-in ads.

(11) Written presentation of "blitz" to farmers.

(12) Written presentation of "blitz" to dealers.

(13) Call report.

(14) Salesman's equipment check list.

(15) Sales story summary.

ORDER HANDLING SYSTEM

IMC's fully automated order handling system is the key feature of a customer service program designed to help fertilizer manufacturers during the heavy production season.

Gopp said that the new automated order handling system cuts down delivery time on potash by as much as three days. The plan enables the order and waybill to be flashed immediately upon receipt to the appropriate plant and railroad, with both plant and railroad scheduling activity on the order within 30 minutes. Waybill and acknowledgment go to the customer simultaneous with the plant-railroad notification.

Gopp explained that findings of a recently completed industrial engineering study would allow loading of many cars in advance of orders, and that some shipments will even be on the way before the orders are received.

"This involves use of the 'rollers' technique," he explained, "by which unconsigned freight cars are shipped into an area to be diverted when the customer order comes in."

"100 WORDS A MINUTE"

The new automated order-billing system virtually eliminates mistakes, helps railroads give immediate loading service, and does away with the need for handling any orders on a rush basis. All orders now are processed at speeds formerly attainable only on an emergency basis.

Keys to the new system are a leased wire communications link between IMC's order department and all major plants, and sets of master punched tapes maintained for each customer and for each product.

By using these tapes, only a minimum of information needs to be added before an order is speeded from Skokie to the plant at 100 words per minute. Tons of product ordered and the shipping date are the two pieces of information required. All other data is contained on the master tape.

Obviously, the plant is relieved from file reference work and paper handling; all effort is concentrated on making the shipment.

A unique feature is IMC's teletype machine which is installed in the Carlsbad, N. M., railroad office of the Atchison, Topeka & Santa Fe Railway. An extension of IMC's own leased wire, it permits the depot manager to receive shipping orders and instructions as fast as they are prepared in the plant.

A copy of these instructions to the plant goes out as an acknowledgment from Skokie to the customer showing exactly how his order is being handled —terms, loading instructions, routing, and special billing instructions.

Waybills are produced automatically on the railroad's unit, activated by the same punched tape equipment used by the plant in preparing bills of lading.

With these immediate instructions, the railroad is able to make up cars and trains for shipment. Under the old system, messengers brought the shipping documents to the depot at the end of the day. Trains would be made up in the evening hours or next day.

"It is obvious that this preparation of cars simultaneously with preparation of the bill of lading will save us a day in most instances, and when a holiday or week-end intervenes, it can mean a saving of three days," according to Gopp.

The "shipping advice" tape created at the plant also is transmitted simultaneously back to Skokie, where the billing department prepares invoices from the tape.

All shipment data, such as car number, analysis, weights, and routing information is available in the IMC Sales Department immediately after shipment for answering customer inquiries.

The order handling system is only one facet of an overall Industrial Engineering technique being applied to IMC loading, shipping, and billing services.

For instance, another part of the entire program involves a statistical analysis of prior years shipments in which the monthly flow is compared with current flow so that they can predict loading volumes. These predictions are transferred into actual car loadings in advance of receipt of orders and is a contributing factor to the speed with which physical shipment is made.

In most instances, IMC now completes the entire order transaction in 24 hours from receipt of the order in the district office through shipping and invoicing. ☆

Communications Center permits almost instantaneous transmittal of a customer order in two directions—to the appropriate phosphate or potash plant with shipping instructions, and back to the customer in the form of an acknowledgment together with shipping instructions.

Preliminary report:

consumption

of commercial fertilizers and primary plant nutrients

in the United States, year ended June 30, 1960

TABLE 1. FERTILIZERS CONSUMED as mixtures and as materials, year ended June 30, 1960, compared with consumption the previous year, by state and region 1/ (Preliminary)

State and region	Mixtures	Materials 2/	Total consumption	Total change from year ended June 30, 1959
	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Maine	191	11	202	-18
New Hampshire	14	4	18	-3
Vermont	18	18	36	3/
Massachusetts	68	15	83	-7
Rhode Island	15	2	17	3/
Connecticut	56	16	72	-7
New England	362	66	428	-34
New York	328	72	393	-30
New Jersey	214	24	238	-17
Pennsylvania	575	81	656	-10
Delaware	87	4	91	-3
District of Columbia	4	0	4	1
Maryland	281	30	311	-11
West Virginia	64	11	75	-1
Middle Atlantic	1,743	219	1,960	-72
Virginia	647	99	746	-50
North Carolina	1,280	326	1,603	-151
South Carolina	578	206	784	-111
Georgia	1,418	318	1,730	253
Florida	1,380	179	1,559	94
South Atlantic	5,306	1,116	6,422	34
Ohio	940	119	1,059	-40
Indiana	882	271	1,153	-25
Illinois	613	869	1,482	-115
Michigan	584	81	665	-71
Wisconsin	372	49	421	-57
East North Central	3,391	1,389	4,780	-308
Minnesota	383	148	531	-17
Iowa	441	250	691	-5
Missouri	525	297	822	-131
North Dakota	49	94	143	11
South Dakota	11	24	35	-4
Nebraska	47	274	321	26
Kansas	114	220	334	44
West North Central	1,550	1,307	2,857	-86
Kentucky	461	110	571	-25
Tennessee	488	133	621	20
Alabama	804	270	1,074	-6
Mississippi	322	369	691	-11
East South Central	2,075	882	2,957	-81
Arkansas	172	190	362	3
Louisiana	149	144	306	15
Oklahoma	78	67	145	14
Texas	298	311	709	44
West South Central	710	812	1,522	73
Montana	4	40	44	2
Idaho	17	126	143	8
Wyoming	1	17	18	2
Colorado	17	74	91	2
New Mexico	2	42	44	3
Arizona	30	147	179	-27
Utah	6	24	30	-7
Nevada	2	4	6	3/
Mountain	81	474	555	-6
Washington	41	173	214	-29
Oregon	34	170	204	4
California	337	4/ 2,432	2,769	179
Pacific	412	2,775	3,187	154
Total	15,630	9,040	24,650	-266
Hawaii	58	69	127	-11
Puerto Rico	212	33	245	-13
United States: 1959-60	15,880	5/ 9,142	25,022	-290
1958-59	16,069	5/ 9,244	25,313	0
1957-58	14,393	5/ 8,163	22,556	2,306

1/ Due to rounding, column or cross totals may not balance. 2/ Includes ground phosphate rock and colloidal phosphate, basic slag, and secondary and trace nutrient materials (borax, metallic salts, sulfur, gypsum, etc.) consumed as separate materials. Does not include liming materials or the quantities of materials used in manufacture of commercial mixtures. 3/ Increases in amounts less than 500 tons. 4/ Decreases in amounts less than 500 tons. 5/ Includes an estimated 270,000 tons of dried manures. 6/ Includes materials not guaranteed to contain N, P_2O_5, or K_2O, amounting to 1,375,000 tons in 1959-60, 1,825,804 tons in 1958-59, and 939,788 tons in 1957-58.

By WALTER SCHOLL,

MARION M. DAVIS,

and CAROLINE A. WILKER*

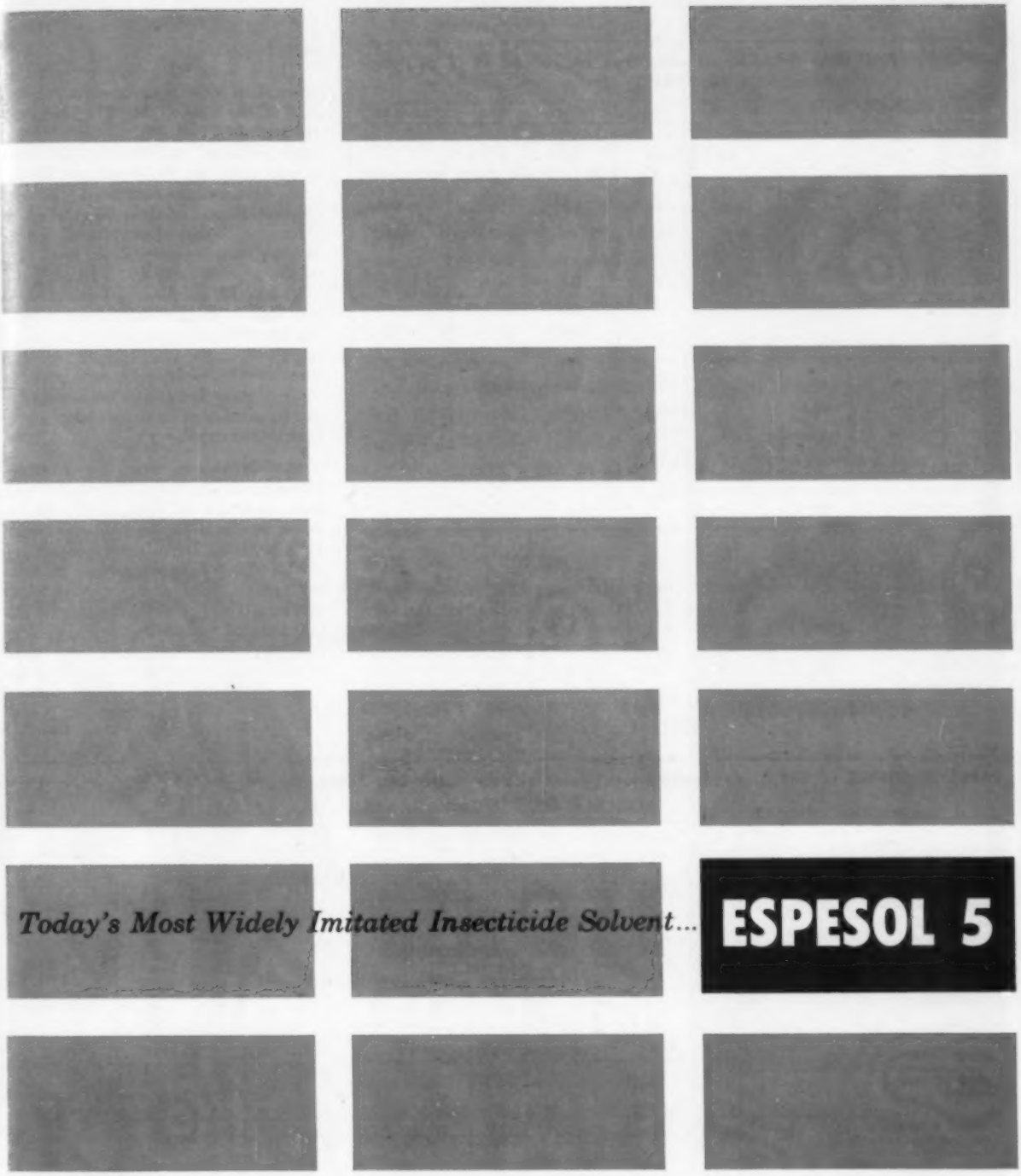
FERTILIZER PRODUCTS marketed for farm and non-farm use in the United States during the year ended June 30, 1960, were generally lower in tonnage than in the preceding year. Total consumption based on shipments by manufacturers, sales by liquid nitrogen applicators, and on state tonnage reports was 25,022,000 tons. This was 290,000 tons (1.1 per cent) less than the 25,312,672 tons recorded for the year ended June 30, 1959.

There were increases in 18 states and the District of Columbia (table 1). In these, 713,000 tons more fertilizer were consumed totaling 9,605,000 tons or about 38 per cent of overall consumption. California, Florida and Georgia accounted for 526,000 tons of the increase.

Consumption decreased in 31 states and Puerto Rico by 1,003,000 tons, approximately one-half of which was in Illinois, Missouri, North and South Carolina. These changes in consumption from the preceding year were scattered through most of the regions. Increases were noted for all states in the West South Central region while decreases were recorded in all states in the Middle Atlantic and East North Central regions.

MIXED FERTILIZERS comprised 63.5 per cent of the total tonnage of all fer-

* *Fertilizer Investigations Research Branch, Soil and Water Conservation Research Division, Agricultural Research Service, U. S. Department of Agriculture, Beltsville, Maryland.*



SIGNAL OIL AND GAS COMPANY
ESPESOL PRODUCTS

SIGNAL OIL AND GAS COMPANY

HOUSTON DIVISION

CALL OR WRITE FOR COMPLETE INFORMATION ON ESPESOL 5

U. S. Terminals:

Houston, Texas — Chicago, Illinois — East Liverpool, Ohio
Madison, Indiana — Brownsville, Texas — Savannah, Georgia
Carteret, New Jersey — Los Angeles, California — Richmond, California

European Terminals:

Dordrecht (Rotterdam) Netherlands • Livorno (Leghorn), Italy

Post Office Box 5008—Houston 12, Texas—Phone WAlnut 3-1651

New York Office: 10 Rockefeller Plaza, New York, Phone Circle 7-2520
Chicago Office: 1515 N. Harlem, Oak Park, Illinois, Phone VIllage 8-5410
Cleveland Office: 20800 Center Ridge Rd., Cleveland, Ohio, Phone EDison 3-0188
Louisville Office: 4th and Broadway St., Louisville, Ky., Phone JUniper 3-7634
Atlanta Office: 3121 Maple Drive., N.E., Phone CEdar 3-3227
Long Beach Office: 2828 Junipero Ave., Long Beach, Phone NEvada 6-3301

TABLE 2. PRINCIPAL GRADES of mixtures consumed in U. S., year ended June 30, 1960 1/ *(Preliminary)*

Grade	Consumption	Grade	Consumption	Grade	Consumption	Grade	Consumption
	1,000 tons		1,000 tons		1,000 tons		1,000 tons
0-10-20	80	4-8-12	212	6-6-6	101	8-24-8	55
0-14-14	158	4-9-3	54	6-8-6	102	10-6-4	82
0-20-20	254	4-10-6	73	6-8-8	243	10-10-10	702
2-12-12	248	4-10-7	244	6-10-4	53	10-20-10	298
3-9-9	464	4-12-8	103	6-12-6	85	10-20-20	62
3-9-12	57	4-12-12	1,158	6-12-12	494	12-12-12	806
3-9-18	83	4-16-16	371	6-24-12	269	13-13-13	69
3-9-27	53	5-10-5	300	6-24-24	247	14-0-14	51
3-12-6	54	5-10-10	1,567	7-28-14	73	14-4-10	69
3-12-12	464	5-10-15	398	8-4-8	58	14-14-14	55
4-7-5	86	5-20-10	77	8-8-8	218	16-48-0	53
4-8-6	50	5-20-20	949	8-12-12	68	Other 2/	1,647
4-8-8	91	6-4-8	74	8-16-16	184	Total	15,880

1/ Grades consumed in amounts of 50,000 tons or more.
2/ Approximately 1,700 grades.

tilizer products consumed and amounted to 15,880,000 tons—a decrease of 189,000 tons (1.2 per cent) from consumption (16,069,027 tons) for the year ended June 30, 1959. In 21 states and the District of Columbia increases were recorded totaling 429,000 tons of which 336,000 tons were in Florida and Georgia. There were decreases in 28 states and Puerto Rico totaling 618,000 tons. Twenty states to the east of the Mississippi River recorded decreases and only eight to the west.

There were 50 grades recorded in amounts of 50,000 tons or more, totaling 12,233,000 tons (table 2). These accounted for 77 per cent of the total tonnage mixtures, and about 1,700 other grades made up the remaining 23 per cent of the tonnage consumed. The relative use of most of these 50 grades corresponded to that of the preceding year although at a somewhat lower level. Five of the grades—5-10-10, 4-12-12, 5-20-20, 12-12-12, and 10-10-10—were those recorded in largest amounts and their combined tonnages accounted for about one-third of the total tonnage of mixtures consumed in each year. One or more of these five grades are among the grades consumed in largest tonnages in most of the states.

MATERIALS marketed for direct application amounted to 9,142,000 tons and comprised 36.5 per cent of all fertilizer products used in the year ended June 30, 1960. Included in this tonnage are 7,767,000 tons of materials containing one or more of the primary plant nutrients (N, P_2O_5, K_2O) and 1,375,000 tons of materials containing only secondary and trace nutrients, principally calcium and sulfur largely in the form of gypsum. The consumption of

TABLE 3. KINDS of fertilizers consumed, year ended June 30, 1960, by region in 1,000 tons 1/ *(Preliminary)*

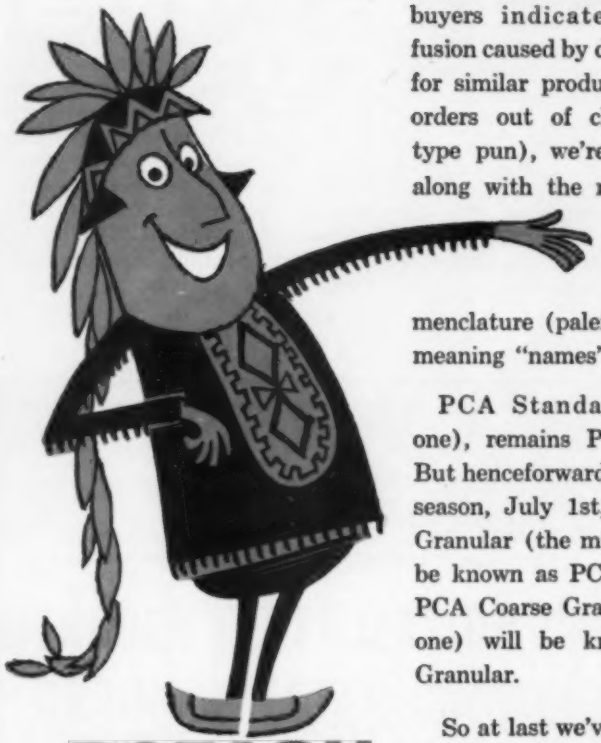
Kind	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Hawaii, Puerto Rico	Total	
											Consumption	Change from year ended June 30, 1959
MIXTURES	342	1,743	5,306	3,391	1,550	2,075	710	81	412	270	15,880	-189
CHEMICAL NITROGEN MATERIALS	15	88	819	513	725	609	515	237	929	75	4,525	31
Ammonia, anhydrous	0	3	86	79	179	72	166	46	145	1	717	35
Ammonia, aqua	0	2/	0	7	15	3	7	23	311	42	398	-74
Ammonium nitrate 3/	7	31	157	158	312	284	127	77	77	1	1,231	-43
Ammonium nitrate-limestone mixtures	2/	1	221	2/	0	37	4	1	2/	0	264	-42
Ammonium sulfate	2/	12	5	106	9	14	80	45	239	25	535	-14
Nitrogen solutions	3	6	161	122	200	29	37	10	79	0	657	142
Sodium nitrate	2	12	224	2	2/	139	54	2/	2/	2/	453	-25
Urea	1	9	5	27	7	4	31	20	37	6	147	37
Other 4/	2	13	20	12	3	7	9	13	41	2/	122	16
NATURAL ORGANIC MATERIALS	17	34	31	35	10	3	7	7	329	2/	473	-45
Dried manures	5	11	5	7	4	2	2	1	272	0	309	-13
Sewage sludge, all	7	16	11	27	6	1	2	4	47	2/	121	-10
Tankage, all	2	5	3	1	0	2/	0	2/	1	2/	13	-6
Other 5/	3	2	12	2/	2/	2/	3	1	9	0	30	-16
PHOSPHATE MATERIALS	32	82	89	633	522	196	247	197	280	14	2,292	-222
Ammoniated phosphates 3/	2/	2	1	20	187	5	121	88	131	3	558	19
Basic slag	0	0	13	0	0	58	3	0	0	0	74	-66
Calcium metaphosphate	2/	2/	1	5	12	16	2/	2/	2/	0	35	-9
Phosphate rock & colloidal phosphate	2/	8	26	471	127	16	23	2/	2/	3	675	-163
Superphosphate: 22% and under	30	69	43	46	46	89	51	16	110	1	498	-10
" : over 22%	2/	3	2	88	149	11	44	79	20	7	403	-2
Other 4/	1	3	3	3	1	1	5	13	18	2/	48	8
POTASH MATERIALS	2	9	76	204	49	68	40	3	15	10	477	-18
Potassium chloride	1	6	33	199	49	51	38	2	8	9	396	-10
Other 5/	1	3	43	5	1	17	2	1	7	1	81	-8
TOTAL: PRIMARY NUTRIENT FERTILIZERS	408	1,956	6,321	4,776	2,856	2,951	1,519	526	1,965	369	23,647	-442
SECONDARY & TRACE NUTRIENT MATERIALS	2/	6	101	4	1	6	3	30	1,221	3	1,375	152
Gypsum	2/	5	97	1	1	5	1	22	1,162	0	1,294	134
Other 5/	2/	1	4	2	2/	1	2	8	59	3	81	18
TOTAL: ALL FERTILIZERS	408	1,962	6,422	4,780	2,857	2,957	1,522	555	3,187	372	25,022	-290

1/ States comprising the regions are listed in table 1. Due to rounding, totals of items may not add to column or class totals. 2/ Less than 500 tons. 3/ Understained quantities may have been used for non-fertilizer purposes. 4/ Includes quantities undesignated by kind. 5/ Includes all reported quantities of grades: 11-48-0, 13-39-0, 16-20-0, 20-52-0, 21-53-0, and 27-14-0.

We're name dropping but...

Big Chief Kay-Two-Oh is only trying to impress you with the fact that all sizes of our 60% Muriate of Potash, by ANY name, are the best bet for your manufacturing operations.

At a recent pow-wow, a special committee of the National Plant Food Institute suggested that distress smoke signals from buyers indicate (ugh!) confusion caused by different names for similar products. To bring orders out of chaos (Indian-type pun), we're happy to go along with the rest of the industry in standardizing our nomenclature (paleface-type word meaning "names").



PCA Standard (the little one), remains PCA Standard. But henceforward, as of the new season, July 1st, PCA Special Granular (the middle one) will be known as PCA Coarse, and PCA Coarse Granular (the big one) will be known as PCA Granular.

So at last we've answered the question: What's in a name? Convenience for you in ordering from any source. But for top quality potash, and top service, be sure to order from PCA, top man on the totem pole.

POTASH COMPANY OF AMERICA

CARLSBAD, NEW MEXICO

"America's CHIEF Supplier of Potash"

General Sales Office:
630 Fifth Avenue, New York 20

Midwestern Sales Office:
First National Bank Building, Peoria, Ill.

Southern Sales Office:
1776 Peachtree Building, N.E., Atlanta, Ga.

Canadian Sales Office:
2 Carlton Street, Toronto 2, Ontario

Phone, Write, Telex or Wire Our General Offices In New York:
Phone LT 1-1240, New York
TWX NY 1-5386

materials containing primary nutrients decreased 253,000 tons (3.2 per cent) whereas consumption of secondary and trace nutrient materials increased 152,000 tons (12.4 per cent).

The principal kinds of materials and the tonnages marketed in each region are shown in table 3. Chemical nitrogen products comprised the only class of primary nutrient materials which increased in overall use. Although most of the products listed in this class were used in lower quantities than in the preceding year, the higher use of anhydrous ammonia, urea, and in particular, the nitrogen solutions offset the decreases in quantities of the other products used. Consumption of the natural organics was generally lower in most areas. The use of phosphate materials as a class decreased but registered gains in the New England, West South Central and Pacific regions. Of the listed products, consumption increased only in the ammoniated phosphates and decreased principally in basic slag and phosphate rock. Potash materials consumed as a class decreased but recorded a small increase in the South Central region. The increased use of the secondary and trace nutrient materials was due principally to the increase in the tonnage of gypsum used in the Pacific region.

PRIMARY PLANT NUTRIENTS supplied by all fertilizer products consumed during the year ended June 30, 1960, totaled 7,571,000 tons (table 4). This amount based on the guaranteed nutrient content of these products with allowances for overruns and underruns determined from analyses of samples reported by state fertilizer control officials, was higher than that found for the larger tonnage of products used in the preceding year. This represented an increase in primary plant nutrients of 155,000 tons (2.1 per cent) from that (7,415,713 tons) consumed in 1958-59. In 1959-60, consumption of nitrogen was 2,767,000 tons, an increase of 94,000 tons (3.6 per cent); that of available P_2O_5, 2,566,000 tons—15,000 tons (0.6 per cent) more; and that of K_2O, 2,238,000 tons—46,000 tons (2.1 per cent) above their amounts in the preceding year. These quantities establish a record high in the Nation's history easing last year's consumption into second place.

Mixtures supplied 1,052,000 tons (38.0 per cent) of the nitrogen, 2,043,000 tons (79.6 per cent) of the available P_2O_5, and 1,967,000 tons (87.9 per cent) of the K_2O. Although the tonnage of mixed fertilizer products was slightly lower than in the preceding year, the content of primary nutrients was higher by 134,000 tons and accounted for over one-half of the increase in nitrogen and all of the increase in available P_2O_5 and K_2O. These higher nutrient contents from lower tonnage of mixtures reflect the continued upward trend in use of higher grade mixtures. The weighted average nutrient contents of mixtures consumed in 1959-60 were for nitrogen, 6.6 per cent; for available P_2O_5, 12.9 per cent; for K_2O, 12.4 per cent, and for the total of these nutrients, 31.9 per cent. The corresponding averages for the preceding year were 6.22, 12.54, 11.91 and 30.67 per cent, respectively.

Primary nutrients supplied by direct-application materials comprised 1,715,000 tons (62.0 per cent) of the nitrogen, 523,000 tons (20.4 per cent) of the available P_2O_5, and 271,000 tons (12.1 per cent) of K_2O. Of these nutrients, only nitrogen was supplied in increased amounts, principally through increased use of anhydrous ammonia, nitrogen solutions, urea, and the ammoniated phosphates. Decreases in the consumption of P_2O_5 and K_2O in direct-application materials largely were associated with decreases in the direct use of basic slag, calcium metaphosphate, phosphate rock and potassium chloride. ☆

TABLE 4. PRIMARY PLANT NUTRIENT contents of mixtures and materials consumed in regions and U. S., year ended June 30, 1960, by kinds, 1/ 2/ in 1,000 tons *(Preliminary)*

Kind	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Hawaii and Puerto Rico	United States: Consumption	United States: Change from year ended June 30, 1959
Nitrogen												
MIXTURES	58	106	300	281	140	100	61	12	47	34	1,052	32
MATERIALS	5	29	208	251	361	206	253	108	385	10	1,715	62
Ammonia, anhydrous	0	0	81	65	147	59	136	38	119	---	587	38	
" , aqua	0	---	0	0	3	1	1	5	68	9	83	-14	
Ammonium nitrate	0	11	51	51	105	96	43	26	26	---	415	-24	
Ammonium nitrate-limestone mixtures	---	---	46	---	0	8	1	---	---	0	56	-8	
Ammonium sulfate	---	0	1	89	2	3	17	9	58	5	111	-4	
Calcium cyanamide	---	1	0	---	0	1	0	1	1	---	3	-1	
Natural organics	1	2	0	0	1	---	---	---	6	---	14	0	
Nitrogen solutions	1	0	41	39	73	9	11	3	18	0	195	36	
Phosphate products	---	---	---	3	88	1	19	14	21	1	87	4	
Potassium products	---	---	0	---	0	---	0	0	0	0	0	-1	
Sodium nitrate	---	0	35	---	---	26	9	---	---	---	73	-4	
Urea	1	4	0	10	3	0	14	9	17	3	67	17	
Other chemical nitrogen products	---	0	0	3	1	---	---	0	6	---	10	4	
Total nitrogen	13	133	508	532	501	306	314	120	432	52	2,767	94	
Available P_2O_5												
MIXTURES	40	258	490	561	392	235	119	16	96	16	2,043	29	
MATERIALS	2	19	14	79	149	41	68	71	78	3	523	-14	
Ammoniated phosphates	---	1	---	10	58	0	30	25	33	1	160	3	
Basic slag	0	0	1	0	0	5	---	0	0	0	6	-6	
Calcium metaphosphate	---	---	1	3	6	10	---	---	---	0	23	-5	
Natural organics	1	1	1	1	---	---	---	---	6	---	11	-1	
Phosphate rock and colloidal phosphate 3/	---	---	1	14	4	---	1	---	---	---	21	-4	
Superphosphate: 20% and under	6	14	9	10	18	10	3	32	---	---	102	-2	
" : Over 20%	---	1	1	41	59	5	29	35	9	2	183	-2	
Other phosphate products	---	1	1	1	---	---	---	7	8	---	19	1	
Total available P_2O_5	47	287	524	640	451	276	181	87	174	19	2,566	15	
K_2O												
MIXTURES	43	198	626	526	191	254	79	3	30	35	1,987	53	
MATERIALS	1	5	28	121	38	36	23	2	17	6	277	-7	
Natural organics	---	---	---	---	---	---	---	---	8	---	8	-2	
Potassium chloride	1	4	20	121	30	31	23	1	9	5	245	-6	
Other potassium products	---	1	8	0	---	5	---	1	4	1	20	1	
Total K_2O	44	203	654	647	229	290	102	5	47	41	2,230	46	
GRAND TOTAL: N, avail. P_2O_5, K_2O												
1959-60	104	363	1,666	1,711	1,177	854	597	212	553	112	7,571	155	
1958-59	130	373	1,592	1,765	1,146	818	552	209	540	117	7,416	0	
1957-58	129	339	1,346	1,569	886	716	497	196	502	103	6,512	-904	

1/ States comprising the regions are listed in table 1. Due to rounding, totals of items may not add to column or class totals.
Dashes (---) represent quantities less than 500 tons.
2/ Represents a weighted average of 8 percent for the colloidal phosphate and 3 percent for the phosphate rock.

FIRST CLASS
Permit No. 67
Sec. 510, P. L. & R.
Willoughby, Ohio

o Postage Stamp Necessary If Mailed in the United States

POSTAGE WILL BE PAID BY

FARM CHEMICALS

Willoughby, Ohio

READER SERVICE DEPARTMENT, FARM CHEMICALS

Please send me the following publications (Circle Item No.):

114	116	118	120	122	12
115	117	119	121	123	12

5-61

New Products

126 12

127 12

Name.....

Title.....

Company.....

Address.....

City & Zone.....State.....

This Card Void After July, 1961

More protein—more meat. High-protein grains pay big dividends in faster-growing, fatter cattle and sheep.

Pass this word on to your fertilizer customers...

NITROGEN FERTILIZATION CAN MEAN 30% HIGHER PROTEIN GRAIN... FASTER-GROWING, FATTER CATTLE AND SHEEP

Nitrogen fertilization can increase grain protein content by more than 30% . . . per-acre grain yield by more than 100%. High total crude protein in grains means more beef, lamb and mutton—*on less purchased protein feed supplements.* Our "Tech-Tips" Bulletin #4 gives full details . . . and Texaco offers 16 Nitrogen solutions for fertilizer manufacture.

Solutions range from 37% to 53% nitrogen content. Sixteen different Nitrogen Solutions—ranging from 37% to 53% nitrogen content—are available at our Lockport, Illinois, plant. Six solutions also contain urea. Delivery is always fast and on-time because of ample loading, switching and transportation facilities.

Technical advisory service available. Write—if you have a technical problem involving fertilizer manufacture. Our Research may have the information you need.

Our manual, "Texaco Ammonia and Nitrogen Solutions For Farm and Industry," also contains much useful information for the fertilizer manufacturer. For your free copy, plus regular copies of "Tech-Tips" as they appear, write:

Texaco Inc., *Petrochemical Sales Division,* 135 East 42nd Street, New York 17, N. Y., or 332 South Michigan Avenue, Chicago 4, Ill., Dept. FC-30.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

TEXACO
PETROCHEMICALS

AQUA AMMONIA, ANHYDROUS AMMONIA, NITROGEN SOLUTIONS, DIISOBUTYLENE, ODORLESS MINERAL SPIRITS, NAPHTHENIC ACID, PROPYLENE TETRAMER AND RUST INHIBITORS, CUMENE, BENZENE, TOLUENE

What the MANUFACTURER *can do for the* DEALER

Part IV—Selecting Training Content

There are few services that a manufacturer can give that are as needed by his dealers as the production of good manuals and systems.

By F. E. HARTZLER

IN THE last article we ended with a plea for specifics in training. This is where the rub comes. In a recent series of thirty schools in basic sales training for an association, we decided to start with sales training that was so basic you could begin the foundations of the building from where we were. In fact, we were down so low that we were under the basement. Yet it turned out that this was just where we belonged. We covered the following:

1) Six basic approaches and their uses.
2) Five methods of handling objections.
3) Six times for suggestion; method and technique.
4) Agreement sentences and seven methods of closing.

Really basic. However, the managers insisted that this was precisely what they wanted—that they did not want any more spell-binders. Anything that their people could not take home and use, they did not want brought up. The schools were so successful that we had to add eight more schools in the middle of the season.

KNOW WHAT THEY MEAN

Now let me point out what this means in terms of your own training. Be certain that if the area that comes up is accounting, you have a clear picture of what these people mean when they say accounting. Accounting covers a multitude of sins. Accounting can cover, for example, the following:

1) Basic bookkeeping.
2) Accounting systems.
3) How to allot expenses fairly.
4) How to make up ratios.
5) How to analyze ratios and statements.
6) Specialized forms such as cash flow.
7) Installing departmentalized systems.
8) Tax accounting.
9) Controllership.
10) Financial planning and budgeting.

You can see that accounting by itself is not enough. The same might be said of any other area. Now the penalty of teaching over the head of a dealer is that you may further discourage him; the penalty of aiming too low is that you may lose some of your best for a school or two. The latter would be less important than you would think. Training programs are usually not designed to improve the very best; they are designed to raise the level of the average and below average.

This again, however, is one reason why I believe you would prefer to run your own samples and find out just what your own dealers need. For example, the instructions that one would give to ten J. C. Penney managers is far different from the instructions that one would give to ten independents. This, as has been said, is the reason for going into the field with questionnaires and determining first what your own people want.

Again let me stress the need for a long term training program. You cannot train managers overnight and even a small gain is won in terms of blood, sweat and tears. Once you have trained your dealers in your methods, and they are used to your patterns, they are not very apt to change. Dealers' adherence to these essentials is important.

Frequently in this series we have talked about manuals. There are few services that a manufacturer can give that are as needed by his dealers as the production of good manuals and systems. If you set up a small credit manual, for example, explaining how to put in credit, how to take an application, how to read this application, how to state terms, how to calculate carrying charges if the dealer intends to use them, and such other details, you will be long remembered.

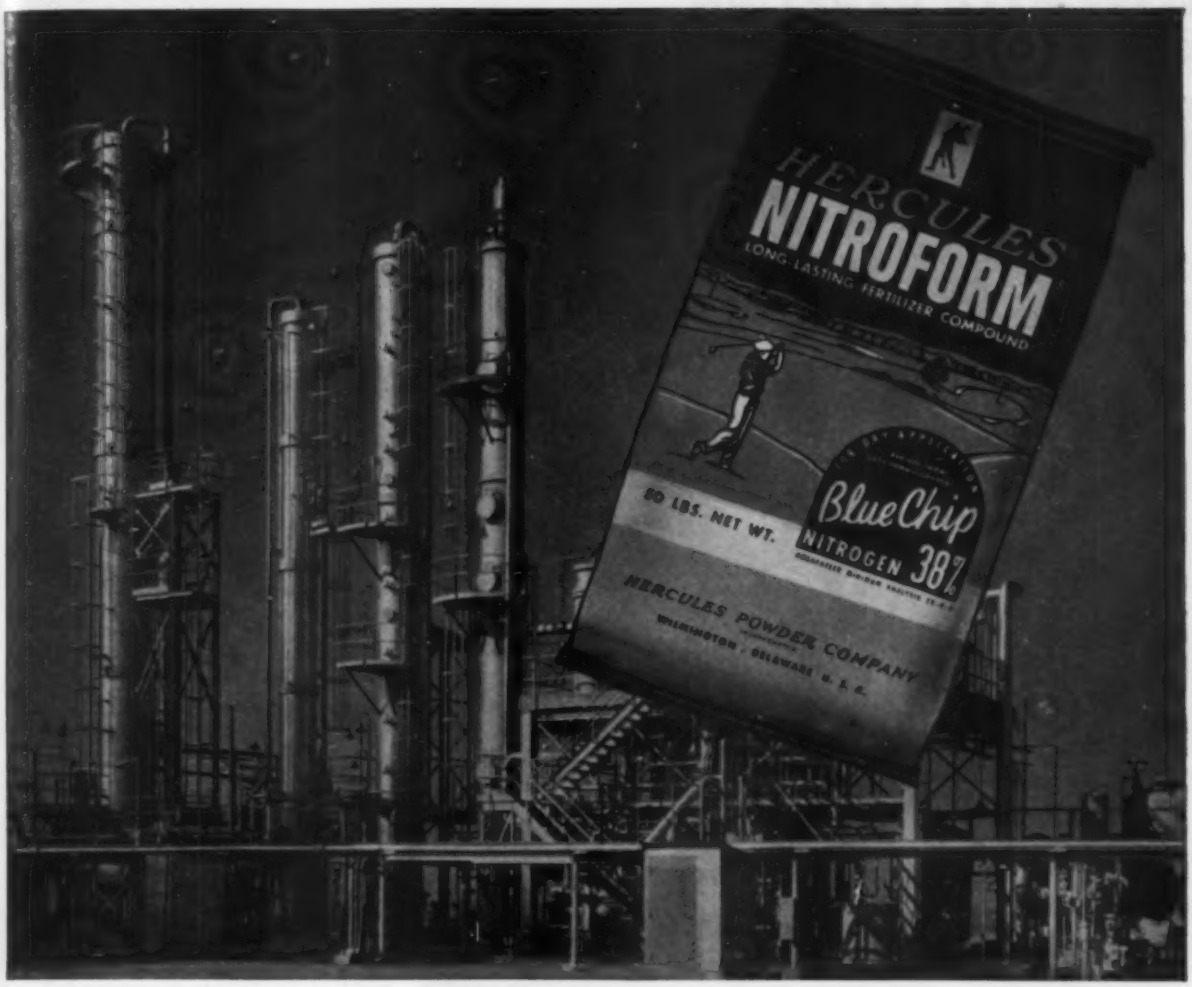
In the farm implement industry, for instance, the industry and many dealers have long realized the need for a method of flat rating and a method of converting hourly charges to correspond with the local labor market. There are many cases where these manuals have been sold, and have never been used for their original purpose. There isn't anyone in the shop who has been trained to handle a flat rate manual.

The same I am sure is true of many things in the fertilizer industry. However, fertilizer dealers have one advantage: their product is so seasonal that it should be possible for many dealers to attend three and four-day training schools if these were set up in their region.

AVERAGE OPERATING COSTS

The last great service that the manufacturer can give the dealers is to bring out average operating costs. To all intents and purposes this is highly secret information to both the dealer and the manufacturer. Therefore some method of coding must be used that will make it secure from those who have no business with it. One can also be sure that if the dealer's figures are on the sheet, he will not make it public. Such a service is given many times by specialized ac-

(Continued on page 34)



NOW...
A Continuous Ureaform Production Unit

At these brand-new facilities in California, Hercules manufactures Nitroform®, the new storage-stable ureaform fertilizer. Rigid production controls maintained at this ultra-modern installation give Nitroform the high activity-index value so vital to quality fertilizer performance.

Nitroform, a chemical bond of urea and formaldehyde, is an insoluble powder which decomposes slowly through the biochemical activity of soil bacteria. Hence, Nitroform is a long-lasting fertilizer compound which will outlast conventional fertilizers as much as six to eight times!

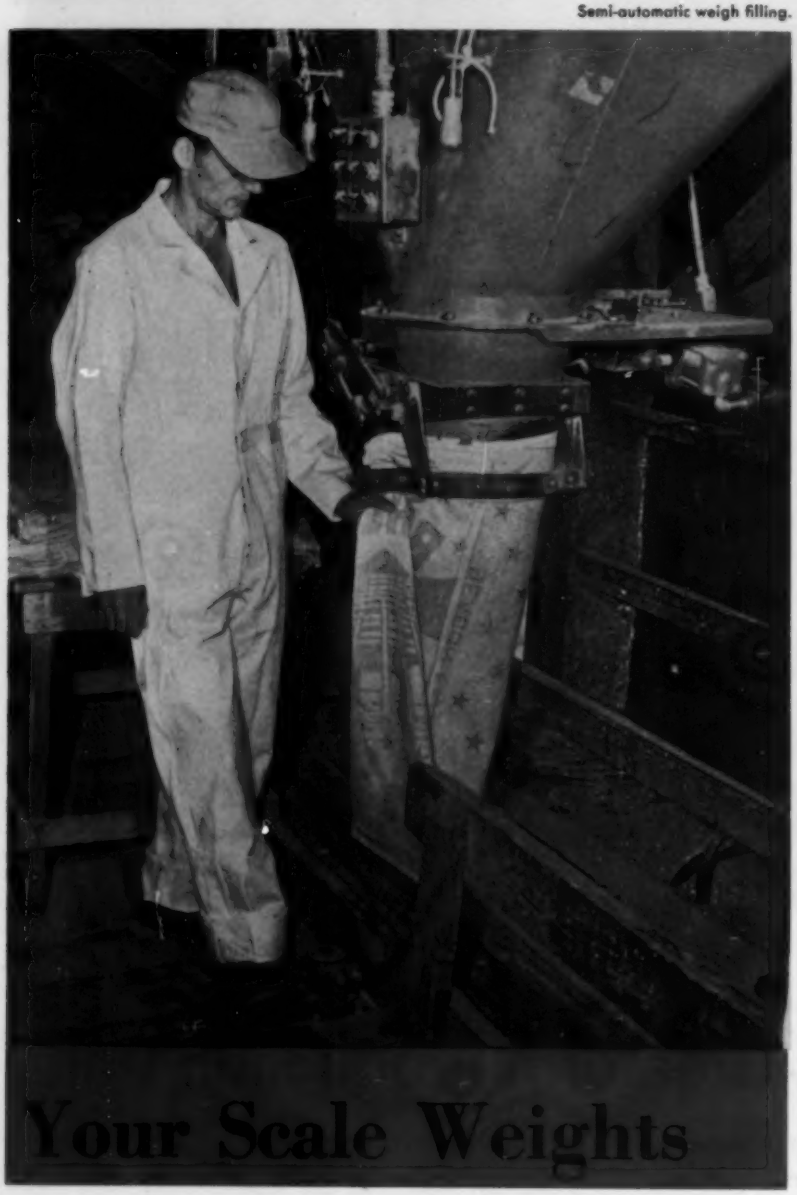
Tailor-made to meet the needs of fertilizer manufacturers around the world, Nitroform is available in a variety of grades. With the new production facilities, Nitroform can be shipped in truck or carload from here and from stock points in the South, Midwest, and East. Write for further data and free sample, or contact your local Hercules Sales Office.

Nitroform® Fertilizer is a product of:

HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

XN61-1

Semi-automatic weigh filling.



Your Scale Weights . . . and your PROFITS

Taking scales for granted might mean the difference between profit and loss, according to results of a recent survey of weights and measures officials.

By ARTHUR SANDERS*

A nation-wide survey of the top weights and measures officials indicates that weighing in the farm chemicals field could be improved, to the benefit of both processor and customer.

In fact, taking scales for granted, the survey indicates, might mean the difference between profit and loss—often amounting to a large amount of money in your business. The scale, while a remarkable device which has aided man throughout recorded history, is a delicate and precision-built instrument which requires care, maintenance and replacement when obsolete to do its job.

For example, J. L. Littlefield, Chief of Weights and Measures of the State of Michigan, reports that "more attention should be given to the checkweighing of agricultural products, especially fertilizers. Scales used are often found in poor condition and usually dirty, causing excessive errors."

Oregon Weights and Measures Chief Walter B. Steele concurs, saying: "Chemical fertilizer scales are generally neglected. The types of minerals used can cause the scale to corrode badly and to need frequent service."

Abuse of scales by neglect, particularly in the chemicals field, is a major problem area. The use of obsolete or worn-out scales is another. Conditions under which weighing is done in farm chemicals are far from ideal, as is well known. Corrosive materials, dust and dirt get into the moving parts of a scale and build up friction, blunting and dulling its precision-made parts. One very important thing to remember about scales is that they practically never give a warning when they go bad.

QUALITY AND QUANTITY CONTROLS BY WEIGHT

The prime uses of scales in the farm chemicals field are for quality controls and quantity controls. Both uses are of significance to every operator in the industry.

Your reputation and good will depend on the quality of your product, and modern batching scales, properly maintained, can assure your standards of good quality day after day. Modern automatic scales with control accessories can also save costs to the extent that this vital protection will pay for itself while giving you the best in quality controls.

To narrow the subject of quantity control, let's briefly mention the scales which control the quantity you sell in packages or bulk. These scales are at the

(Continued on page 26)

*Executive Secretary, Scale Manufacturers Association, Inc.

How Union-Camp's 5-Star Multiwall Plan increased a pallet payload by 400 lbs...without increasing its size!

A leading supplier of high density resins* had been packing his product in 50-lb. sewn-bottom multiwalls. This gave him an efficient, 40-bag (2,000 lb.) pallet load.

When he added a *low density* resin to his line, however, he found his existing bag wouldn't accommodate 50 lbs. of the new resin due to its increased volume. A slightly larger, sewn-bottom multiwall was tried, but this reduced the pallet payload to 32 bags (1,600 lbs.). Net "loss": 400 lbs. Net result: more handling . . . more trips to the warehouse . . . higher cost.

Heightening the pallets to 10 tiers instead of 8, offered no solution—they wouldn't pass through the existing archways. To say nothing of the problem of loading trucks and trailer cars.

New bag does the trick

At this point, the 5-Star Packaging Efficiency Plan went to work. Union-Camp multiwall specialists experimented with several different bag sizes and styles. Their solution—a multiwall with a *pasted* bottom and side gussets, a *rectangular*-shaped base—and 20 per cent more capacity!

With the new design, 50 lbs. of the low density resin can now be packed in each bag. Most importantly, the pasted bottom bags can be palletized five to a tier, eight tiers to a skid for a total payload of 2,000 lbs.—the same as the high density resins.

Warehouse space saved

The pasted-bottom bag offered several outstanding advantages. It permitted better use of warehouse space. It increased the yield per warehouseman to *1,000,000 lbs. a month.* And it initiated the development of a similar design for the company's high density resins, which could increase the present pallet payload to 2,500 lbs.

Space-saving secret is in bottom of bag. New design (left) with rectangular-shaped base has 20 per cent more capacity than sewn-bottom bag (right).

Works for you five ways

Apart from bag construction and materials handling, Union-Camp's 5-Star Plan covers bag design, packaging machinery and specifications control. An improvement in any one of these areas conceivably could result in substantial savings for you. In any case, it costs nothing to find out. See your local Union-Camp man for complete details.

2,000 pallet load of new, low density resin bags fits easily through existing doors.

FREE 16-PAGE BOOKLET

Write Dept. M-3 today for a free copy of Union-Camp's new 5-Star Plan booklet. It describes many case histories showing how packers like yourself have achieved greater efficiency and economy in their multiwall operation.

UNION-CAMP

MULTIWALL BAGS

Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

* NAME ON REQUEST

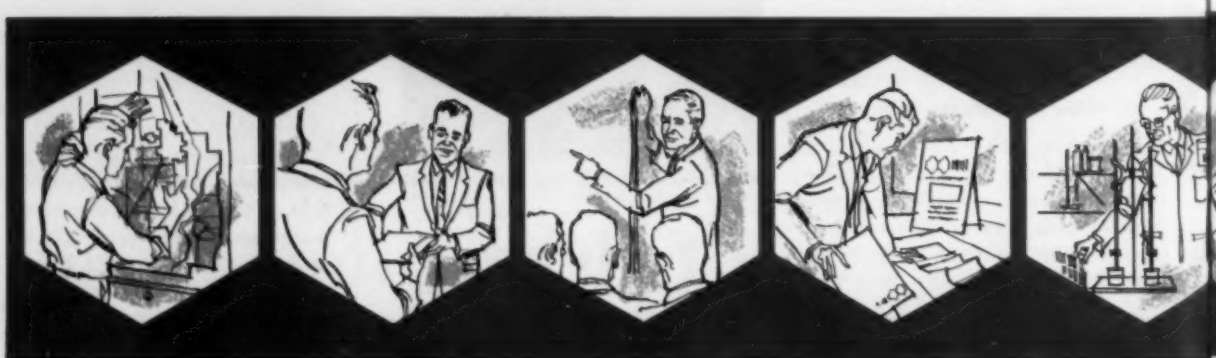
These services (and more)

IMC TOTAL

Why limit your total opportunity

Many of the fertilizer industry's most successful manufacturers rely on IMC as a single source for their full line of raw materials* and total service.

IMC interests itself in every phase of your marketing operation . . . does something positive about it. Total Service embraces marketing assistance, sales



MARKET ANALYSIS HELP | MANAGEMENT HELP | SALES, DEALER, FARMER MEETING ASSISTANCE | ADVERTISING PROMOTION HELP | TECHNICAL SERVICES

MOST COMPLETE LINE OF FERTILIZER MATERIALS

Phosphate Rock • Calcined Phosphate Rock • Triple Superphosphate (Run-of-pile, Coarse, Granular) Phosphoric Acid • Muriate of Potash (Standard, Coarse, Granular) • Sulphate of Potash • Sul-Po-Mag®

are yours with

SERVICE!

with anything less?

services, management help, technical service, year-round planning, transportation, insurance, safety, and credit and collection assistance.

Why limit your potential . . . take advantage of IMC's Total Service for your fullest profit opportunity. Join forces with IMC!

YEAR-ROUND SALES PLANNING

INSURANCE AND SAFETY

CREDIT AND COLLECTION ASSISTANCE

SALESMEN TRAINING PROGRAMS

TRANSPORTATION SERVICES

AGRICULTURAL CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

ADMINISTRATIVE CENTER, OLD ORCHARD ROAD, SKOKIE, ILLINOIS

IMC

PRODUCTS FOR GROWTH®

®TRADEMARK

FO-5-61

Your Scale Weights . . .

(Continued from page 22)

point of "no return" as far as overweights are concerned. As to underweights, it's probable those bags will be returned, or that there will be an undeclared war on your good will.

The point to be made is that the fertilizer manufacturer can have good weights if he will and at no great cost per thousand weighings. Good, modern scales and maintenance are available to get the job done for you. If it's worth the effort of weighing, it's worth weighing right—and, remember, a 5 per cent loss on $100,000 worth of fertilizer is just as great as a 5 per cent loss on $100,000 of gold bullion—it's still $5,000. The big difference is that gold traders see that the scales used are correct, and that's not always true with fertilizer.

CONTROLLING SCALE ERRORS

Howard E. Crawford, City Sealer of Jacksonville, Florida, a leader among the nation's weights and measures sealers, strongly advocates frequent testing of scales to help avoid these costly, excessive errors.

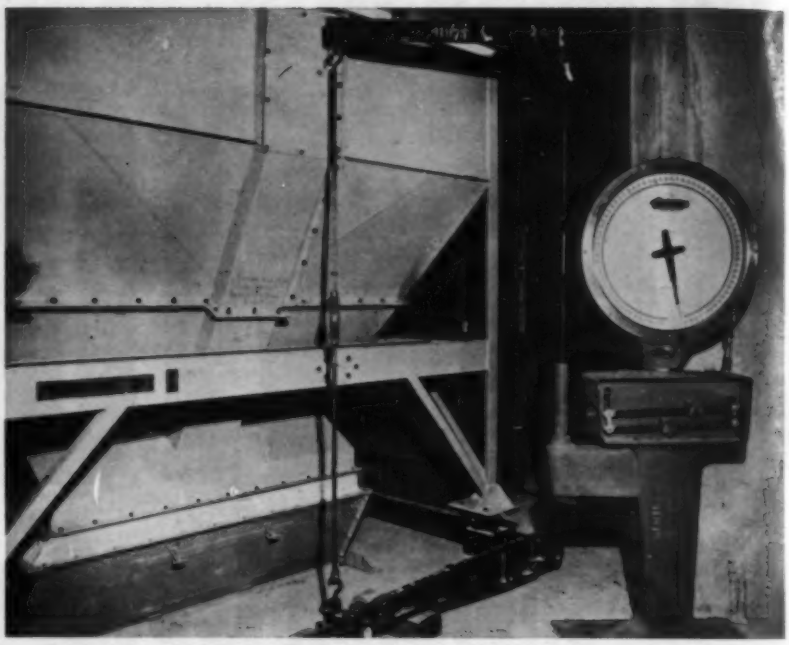
Declares Crawford: "We feel that in many industries, scales should be tested by a private service organization at least quarterly, *while in fertilizer and chemical plants, they should be tested monthly*." (Italics supplied.) He adds that: "The scale owner or operator who has the responsibility of selling merchandise by correct weight should test his scales daily within the capacity of the articles he is packaging or weighing."

If you consider your scales as delicate, precision instruments and give them proper care and maintenance, they will give dependable service. Crawford reports further that, "Heavy duty scales used in fertilizer, lime and chemicals plants" require more service than any other commercial scales.

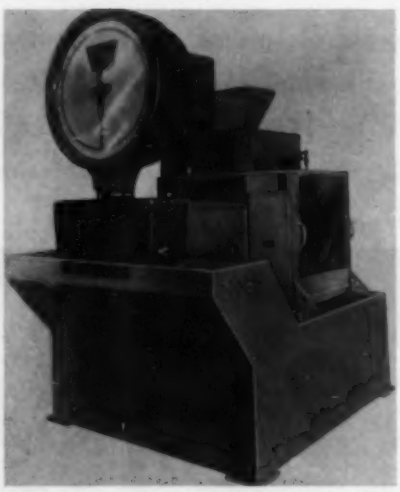
You can help yourself by treating your scales to proper use and care. Your scale is a sensitive mechanism built to accurate tolerances — often closer than one ten-thousandth of an inch as in a fine watch. If it is jarred out of alignment by shock, the accuracy of the scale is impaired, and you may find that you are giving away a goodly chunk of legitimate profits with each item weighed and sold.

The other side of the coin must be considered, too. It's obviously bad business, no matter how unintentional, to give short-weight because of scale errors due to mishandling of the equipment. It can be costly in losing customers and money. Business is people, and serious

(Continued on page 34)



Automatic indicating hopper scale for collecting ingredients—6,000 pounds capacity.



Proportioning scale. This is the weighing unit of an electronically controlled proportioning system. The proportioning formula is set into the remotely situated panel board and the automatic operation takes over. These systems can be produced for special requirements of the plant.

Automatic net weight bulk shipping and receiving scale provides dial indicator plus adding machine tape record of gross and tare of each weighing and the final net total.

WANTED:

far-sighted salesmen to sell new fertilizers a new way in the Midwest

Effective October, 1961, fertilizers will be sold a new way in the Midwest. They will be sold as part of a program. A program tailored to specific soils and crops, that begins with planting and follows right through to plentiful harvest. In short, an ORTHO fertilizer program.

What is this new way of selling?

To put it simply, it is selling *results*, rather than a product. It is selling the increased yields and higher profits fertilizers can bring, rather than fertilizers themselves. ORTHO has sold fertilizers this way in the West for years, with outstanding results. The ORTHO fertilizer program is something farmers have come to rely on. Soon, for the first time, the kind of fertilizers used in an ORTHO program will be available in the Midwest. They will be made in an entirely new way, by an exclusive process, at a huge new 22 million dollar facility being built at Fort Madison, Iowa.

What kind of man is needed to sell them?

First and foremost, he must be interested in doing something for somebody else. Because this man's whole premise in selling ORTHO fertilizer in an ORTHO program is to *help the farmer increase yields, and make money* with the products he sells. Because the company he will work for—the California Chemical Company—is not just interested in sales today. They are interested in the long-term growth of agriculture in the Midwest. Education? A college degree or the equivalent. Experience? At least two or three years of successful selling.

What does this company offer him?

Most important – rewarding work. The ORTHO slogan is "Helping the World Grow Better". Men who work for this company will be doing exactly that. Opportunity for advancement is unlimited. A man can grow within, and *with*, a company which – already a world leader in agricultural pesticides – is heading for new horizons in the exciting field of petrochemicals. Fringe benefits are far above average—the same as those of the parent company, Standard Oil Company of California. Applicants are being hired right now. Send resume of experience, with a letter outlining long range aims and ambitions, to Mr. E. H. Solinsky, California Chemical Co., Ortho Div., 200 Bush St., San Francisco, Calif. Replies will be held in strict confidence.

ORTHO®

HELPING THE WORLD GROW BETTER

California Fertilizer Conference

By JOHN AHERN

James F. Sloan opens the conference. Seated at right are George Park and Sid Bierly.

Dr. Perry Stout makes a point

Luckhardt introduces the Nitrogen Panel—J. W. "Chappie" Chapman, John Pryor, D. W. Galbraith, Howard H. Hawkins. Fifth panel member, Dr. William Martin, is shown at right.

"Sid" Bierly, Dick Greene and "Mac" McCollam

Bob Proseal of Cal Poly has a talk with Earle Shawe. In center background, Mr. Getty, CDA.

Second morning—the rains came. Dr. Perry Stout and "Sid" Bierly.

"Lucky" Luckhardt chats with De Witt Bishop

FROM THE formal opening by California Fertilizer Association President J. F. Sloan and the welcome by Cal Poly President Julian McPhee, to the concluding remarks by General Manager Sidney H. "Sid" Bierly, the Ninth Annual California Fertilizer Conference was an interesting, informative and thoroughly dynamic affair. Sponsored by the Soil Improvement Committee of the Association, the two-day meeting—March 28 and 29—attracted an attendance of some 225 to the California State Polytechnic College campus in Pomona.

Mr. Sloan set the general theme when he reminded the audience that 40 per cent of the people in the United States today are employed in agriculture or an agriculture-related industry. At the same time, he said, China and Russia are as much in awe of our productivity in this field as they are of our guns. And those who bemoan the stockpile of agricultural surpluses might also consider the huge stockpiling of metals that is being done.

Dr. McPhee, who is in his 28th year as president of California Polytechnic, welcomed the conference members to a new campus on the move. Following a concise outline of its brief past, he pointed to a future that expects to see 22,000 students on the grounds by 1980.

Mr. De Witt Bishop of the State Department of Agriculture in Sacramento reported on changes in his department—including an arrangement into six new divisions—thereby accenting the division, rather than bureau, without adding new personnel. A revision of accounting has been completed also, but basically, so far as the outside contacts are concerned, there will be no major changes. Fertilizer contacts will remain the same. He reported that of over 1,200,000 tons of fertilizer sold in California in 1960, 37 per cent was in the liquid state, a point made more of later in the day's discussions.

SUGAR AND FERTILIZER

Dr. Roger Humbert, speaking on "The Changing Sugar Picture and its Influence on California's Fertilizer Potential," stressed that more fertilizer is equal to more sugar in production, as beets will store more and more sucrose

attracts 225 to Pomona

—up to an optimum. In order to continue in production past that point, Dr. Humbert says new hybrids will be forthcoming—hybrids which will require and utilize a greater chemical amount to produce an even greater percentage of sugar on a per acre basis.

REPORT ON ZINC STUDIES

Dr. B. A. Krantz, University of California at Davis, presented a paper on "Recent Soil Studies with Zinc"—a work co-authored with A. L. Brown. In it, he cited results of experiments carried out on soils from 19 California counties, sharply contrasting results from 0, 5 or 25 pounds of zinc used per acre. His talk was illustrated with a series of charts as well as color slides, one of which showed that three years after the application of zinc to a field of barley, the results were still discernible in patterns of stronger color and more advanced state of the plants.

Dr. James Cook of the University of California at Davis discussed the problems of determining nitrogen deficiencies in grapes. A petiole nitrate test has been derived which, based on cluster position at bloomtime, gives a relative analysis. Based primarily on studies of Thompson Seedless, the method has not proved out well in areas where vines are girdled, however. In strongly irrigated areas, the rules are different, too, as well as shifting when the test was tried on other strains. The influence of spring rains along the coast made the petiole nitrate test inoperative. Though Thompson Seedless was the major test plant because of its majority in the San Joaquin Valley, Dr. Cook indicated studies will be carried on in due time for the tremendous variety of stock along the coast. He also said as many plantings suffer from too much fertilizing as suffer from too little. Some growers avoid nitrogen because of color loss and he questioned whether—despite grower reaction—it will not be possible to eventually arrive at a solution, possibly through spraying.

Haven Leavitt of Shell Development Company in Modesto, speaking on "Future Nitrogen in California," opened his remarks by looking back to look ahead. He pointed out that in the 1930's ammonium sulfate was the prominent fertilizer, followed in the '40's by sodium nitrate and ammonium nitrate. Newest in gaining attention, though not newest in the field of fertilizers, is ammonium chloride, first used commercially in Japan and going to be used in India, where they don't have the sulfate necessary for production of ammonium sulfate. Another relative newcomer is magnesium ammonium phosphate, almost water insoluble and possibly truly slow acting.

Dr. Perry Stout of the University of California at Davis, departing from his subject of "Micronutrients Needed for Plant Growth," gave an explanation of trace elements which become micronutrients and translated atomic weights of minerals into parts per million in micronutrients—then to micromals per hundred grams of plant material.

In the panel discussion of the afternoon, moderated by Mardy Rose of the J. F. Sloan Company, Randy Keim of Wilson and Geo. Meyer & Company, San Francisco, discussed a variety of zinc fertilizer combinations—and Dr. John Lingle of the University of California at Davis reported on "Micronutrients in Vegetable Crops."

NITROGEN PANEL

The second day of the conference was occupied with a panel discussion on nitrogen. Moderator was R. L. "Lucky" Luckhardt of Collier Carbon & Chemical Corporation in Los Angeles. Opening speaker was Dr. William E. Martin, of the University of California at Davis. Dr. Martin, in a series of chart slides, showed that in the years between 1940-1960 potash usage in California increased four times and phosphorus five times, but nitrogen increased by 8½ times, to a point where, in the last five years, it claims at least 70 per cent of the market. In the same time and with the greatest trend set in the '50's, liquid nitrogen has increased by 27 times. In fact, in the last four years over half the market has been supplied by liquids—attributed to the extra convenience of using liquid. Concluding, he questioned that the trend to such an abundance of nitrogen without a compensating use of other minerals was to be desired.

John Pryor of the John Pryor Company in Salinas reported on nitrogen in his area, pointing out that use of the chemical has, in cases, had the strong advantage of producing crops at least two weeks early, thereby avoiding many of the diseases and parasites detrimental to the plants, especially in the strawberry and celery fields.

D. W. Galbraith of Agriform Chemical Company, Inc., Woodland, reported on the use of nitrogen in his area and its direct results on turf grass.

Concluding the morning was Howard H. Hawkins of Golden State Plant Food Company in Glendora, who took issue with some of his fellow speakers. He said, plainly, that without fertilizer you couldn't afford to work most of the land in California and proceeded, with a certain tongue-in-cheek touch, to proclaim that the dealers present will go down in history as the great thinkers of our time. On a strong affirmative note, he reminded the conference that, in opposition to previous statements, he believed the farmer went to liquid nitrogen and other fertilizers, not entirely because nitrogen was cheap—the farmer was sold.

QUESTIONS FOR THE PANEL

Hawkins was followed by a general period of questions from the floor with discussion by members of the panel and comments from the general assemblage.

It was pointed up, in a series of comparisons by D. W. Galbraith, that possibly the future will see, instead of an increasing use of nitrogen, a pattern of combining it with other minerals. There was no quarrel with his statement that balancing money against results, nitrogen produced.

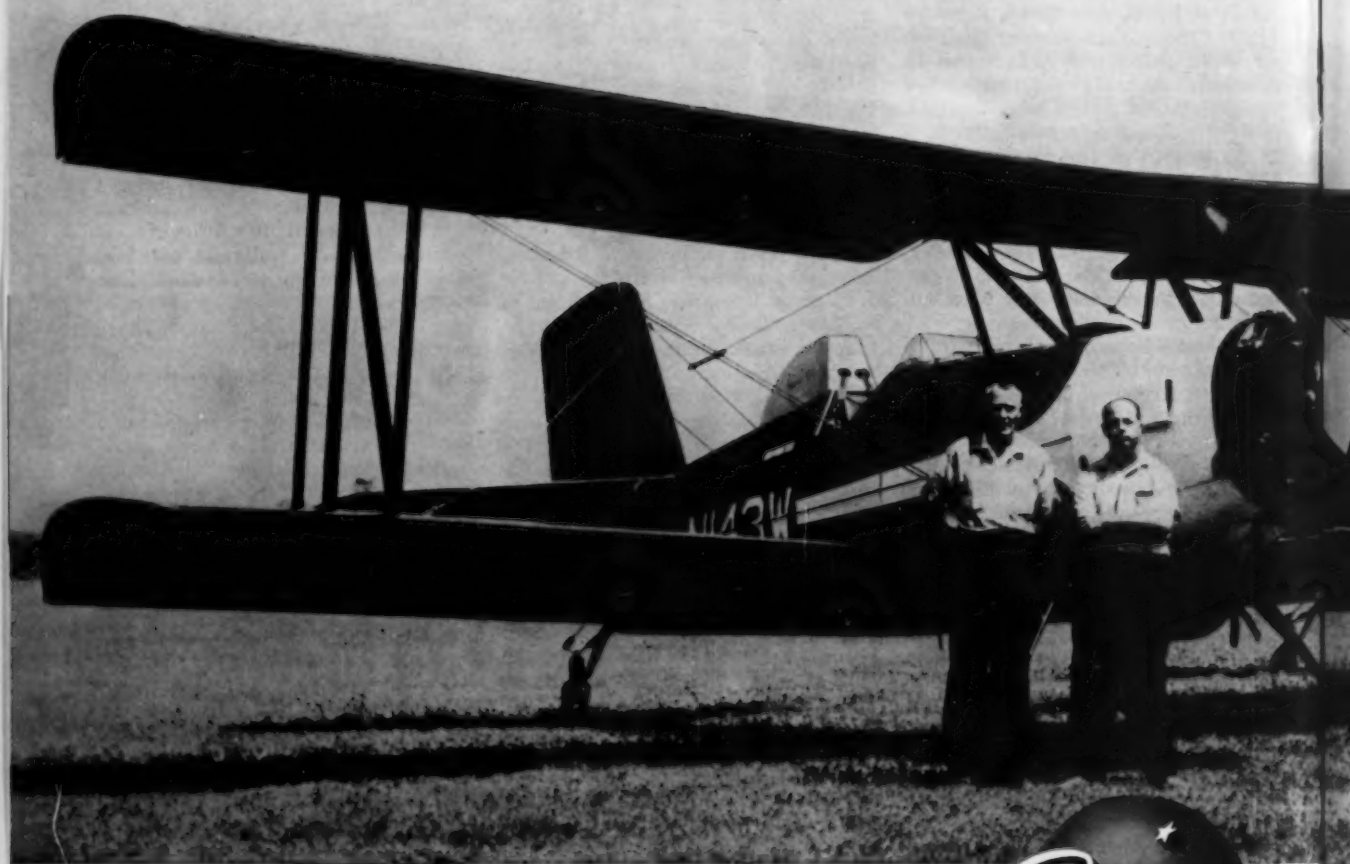
J. W. "Chappie" Chapman of Fresno Agricultural Chemical Company, speaking of the future of mineral application and cost, suggested that the time may come when the farmer will need to be able to make his own application of fertilizers. Howard Hawkins took the opposite view, saying that even in cases where a farm has acreage enough to warrant such application, the job is done better by the experienced dealer-applicator.

D. W. Galbraith, in answer to a question on studies of the use of urea, reported the commercial value small at present because of cost although his organization has tried it in conjunction with strawberries. At present it is basically being used for bermuda and related grasses.

Dr. Martin explained part of his previous discussion by saying he thought we need a larger proportion of phosphorus to nitrogen in our overall usage before we need less.

In a very brief mention of the difference between the price of minerals to the large and the small user, Howard Hawkins stressed the greater service given the man who uses less. In this case the supplier is selling not price but the extra service the farmers needs. ☆

"We test flew every new ag-airplane and we bought the GRUMMAN AG-CAT... four of them!"



GRUMMAN

AIRCRAFT ENGINEERING CORPORATION

Bethpage · Long Island · New York

David Setter and Warren Nichols of Weslaco Flying Service, Inc., Texas, tell you their reasons why:

"Weslaco Flying Service licensed the first war surplus Stearman. We operated the first spray plane in south Texas. Always a leader in the field, we test flew every new airplane that could be considered an ag-airplane. Last year we bought our first Ag-Cat for an evaluation trial. Before the season had finished, we had three. We have now purchased our fourth one because of load carrying ability, ease of handling, low-cost maintenance and better swath penetration. The Grumman Company is constantly improving the Ag-Cat. Basically it has not changed, but many small parts have been modified or beefed up. The Grumman people are definitely on the ball as far as necessary modifications are concerned. We strongly advise trying the Ag-Cat in your business."

Warren Nichols

David Setter

If you'd like more information on the Grumman Ag-Cat—now at a new, lower price of $14,525—contact the distributor nearest you.

Aero Spray & Dust Service
Accord, N. Y.

Sun Valley Dusting Co.
Box 1671, San Benito, Texas

French Aviation
1849 Airport Drive
Bakersfield, Calif.

Wilson Air Service Inc.
Bridgeton, N. J.

Magnolia Aviation Co.
P. O. Box 683
Laurel, Mississippi

Blue Mountain Aviation & Dusting Corp.
Route 4
Walla Walla, Washington

Lyon Flying Service
Box 726
Welsh, La.

Mid-Continent Aerial Sprayers, Inc.
Box 307
Hayti, Missouri

new trends in PESTICIDE FORMULATION

was the topic for a symposium at the American Chemical Society's 139th national meeting in St. Louis, March 21-30. Among the many papers presented were those abstracted here.

Solid pesticide formulations. Past, present, future. *Erwin S. Loeffler, Agricultural Chemicals Department, Union Technical Service Laboratory, Shell Chemical Company, Union, N. J.*

Solid formulations of pesticides have a long and useful history. Initially they were simply low concentrations of solid toxicants, such as sulfur ground with an inert diluent. Today they include a wide variety of formulations where so-called "inert" solids are used as diluents or carriers. These inerts include processed minerals, synthetics, and botanicals. Formulations include dusts, concentrates, wettable powders, and granules.

The progress of solid formulations closely paralleled the pattern of pesticidal development. The introduction of DDT in 1939 ushered in the "Modern Pesticide Era." The extreme effectiveness of small quantities of these insecticides required a new dimension in the science of formulation. New techniques, new formulation equipment, and new application equipment were developed or adapted to meet the expanding use of pesticides.

As the use of these newer pesticides became commonplace, economic competition brought changes in pesticide formulations. Economical dust concentrates became feasible through utilization of highly sorptive processed clays and synthetic silicates.

Granular formulations initially were developed to permit application of larvicides through foliage into swamps. Today granular pesticides have found application for use in soil, in fertilizers, and for foliage application.

Residual insecticides are controlling mosquitoes throughout the world through the development of highly suspendible wettable powders.

In the future, it appears that the use of dusts may decrease; but granular formulations will expand. Recent developments on the mechanism of action and interaction of the phosphate pesticides will stimulate development of improved carriers. New and different types of solid carriers will enable us to control release rates and, thus, improve effectiveness. Most important, the pesticide formulation is becoming more a science than an art. Thus, formulations in the future will be directed toward the most vulnerable link in the life cycle of the pest—with greater economy and safety than heretofore has been possible.

Liquid Pesticide Formulation: Past, Present and Future. *James W. Hansen, Ortho Division, California Chemical Company, Richmond, California.*

Commercial pesticide emulsions first originated about 1880 as mixtures of kerosine, water and soap. Minor improvements such as fish oil soap, turkey red oil and rosin soaps were introduced, but the first major changes were the sulfonated vegetable oil emulsifiers and the introduction of refined white oils in about 1920. The present chapter begins with the development of the nonionic emulsifiers and with the use of DDT as an emulsifiable solution in xylene or other aromatic solvents and swings into full gear with the introduction and use of blended emulsifiers just a little over ten years ago.

The majority of our present pesticide emulsions are based on the very careful blending of a group of nonionic and anionic emulsifiers to give efficient performance at low emulsifier levels over a wide range of conditions. This blending increases the fluidity of the interfacial film and its density. Starting first with low toxic concentration levels, the trend has been toward more and more concentrated and toward multiple ingredient products. The latest development has been emulsifier pairs. Each member is a complex blend of its own and by blending the two the pair can be used for a wide variety of products.

Use of stabilizing agents to decrease decomposition of malathion on high-sorptive carriers. *James A. Polon, Minerals and Chemicals, Philipp Corp., Menlo Park, N. J.*

The decomposition of malathion when impregnated on certain mineral carriers has long been a problem in the pesticide industry. Theories concerning the causes of the decomposition are reviewed and discussed. A comparison is made of the variability of catalytic activity of two high-sorptive carriers, an attapulgite and a montmorillonite, taken from random lots. Comparative data were presented on the rates of degradation on these carriers along with data on a few low-sorptive diluents.

Based on results reported in the literature on the causes of decomposition, additives were chosen, and their stabilizing ability was determined. Comparative data are presented on the stabilizing efficiency of glycols, tall oil compounds, and other milk organic acids. The data indicate that the tall oil compounds are slightly more effective in their stabilizing action than the glycols. Although no additives have as yet been found to inhibit completely the decomposition of malathion impregnated on a high-sorptive carrier, the use of tall oil as a stabilizing agent results in dust concentrates that exhibit adequate stability for short-term storage.

Formulation of granular heptachlor for imported fire ant eradication. *W. F. Barthel, Calvin Corley and C. S. Lofgren, Plant Pest Control Division, Agricultural Research Service, USDA, Gulfport, Miss.*

The problems of formulation of granular heptachlor were studied in order to determine how the various components of the formulation affect insect kill, effective soil residue, forage residue, shelf life, and handling properties. For a formulation to be ideal it should provide rapid ant kill with a lengthy effective residue in the soil, yet at the same time cause a minimum of undesirable residues on forage or crops. Also, the formulation should flow evenly, have little dust, and permit storage for at least a year without deterioration.

The present hydrocarbon solvents used in formulation of granules are lost rapidly after application and so provide no protection for the residue in the soil. Because of their solvent power these hydrocarbon solvents create residue problems by permitting rapid penetration of the plant surface by the insecticide solution which is released from the granules.

The effect of some alternate solvents has been studied. ☆

Stainless Steel sprayers save fruit grower $1875 a year

500-gallon "Speed Sprayer" by John Bean Division, Food Machinery & Chemical Corp., used by the Adams Packing Association.

This mark tells you a product is made of modern, dependable Steel.

Mr. B. T. Reynolds of Adams Packing Association, Auburndale, Florida, says, "We rely on our Stainless Steel spray tanks. Because they're so corrosion-resistant, there's no scale to plug up the nozzles. So, we get the job done on schedule without any wasted time and labor. And we expect these tanks to last indefinitely."

Before Adams Packing switched to Stainless Steel fruit sprayers, they had to clean their spraying equipment each time they used it. And, the old sprayers required a $135 maintenance job every three years. Stainless Steel tanks have eliminated both maintenance expenses. With Stainless Steel, they just rinse the sprayers out at the end of the spraying season.

Mr. Reynolds estimates that they save a dollar a day labor cost for cleaning during the spraying season. Figuring 15 tanks, an 80-day spraying season, plus a share of the major maintenance cost, the Stainless Steel tanks save about $1875 in labor and maintenance each year.

United States Steel Corporation • American Steel & Wire Division • National Tube Division • Columbia-Geneva Steel Division • Tennessee Coal & Iron Division • United States Steel Supply Division • United States Steel Export Company

For more information about Stainless Steel tanks, send the coupon.

United States Steel Corporation
525 William Penn Place, Room 6287
Pittsburgh 30, Pennsylvania

Please send me a copy of your free booklet, "Stainless Steel Tanks for All Farm Chemicals."

Name_____

Address_____

City_____ Zone_____ State_____

USS Stainless Steel

TRADEMARK

NEW PACKAGING

for the Age of Automation

WEST Virginia Pulp and Paper Co. has under way a broad program which has made significant progress in developing a whole new family of packaging products, each uniquely tailored to perform efficiently in an automated, mass distribution age.

This program has been stepped up in the past year as the result of the development of new trends in nearly every field based on automation in production, handling, warehousing and distribution. These new trends include bulk loading and palletizing and the development of mass consumer sales directly from shipping containers and vending machines. They include more emphasis on impulse buying through point-of-sale packaging and the development of packages that lend themselves to coding to permit automated handling.

The new packaging being developed by West Virginia has been and is being designed to meet the exacting requirements in these many fields. In broad terms, these packages are lighter, stronger, single-ply containers and wrappers which lend themselves to palletizing and bulk loading. At the same time, these new packages give the designer more scope and surface on which to practice his art and the affinity for type and color to bring that art to life.

The sweep of West Virginia's packaging program covers new types of frozen food cartons; new types of lightweight folding containers; new container-type bags and boxes for the shipment of both bulk and packaged products and a variety of improved packages to hold both dry and liquid food products. The new packages in the food field will make it possible in many cases to eliminate inner and outer wrappers and provide a better surface and more surface on which to print.

A number of West Virginia's newly designed packages are expected to be in commercial production as soon as present tests under actual distribution conditions are completed. Others have been put through the testing stage and are now in production.

Two of these now on stream are in the bag field. One is a superior, single-ply, lightweight shipping container with the trade name *Balex*. It is made of a new type of Clupak extensible paper and outperforms any single or double-wall baler currently available, W. Va. says.

The second product is a new, versatile double-ply bag especially designed for consumer use. Called *RakSak*, the new bag holds everything and is furnished with a rack that keeps the mouth open, either in upright or in horizontal position to permit easy loading and disposal. It is ideal for yard, garden, workshop and garage cleanup and can be used in the home for nearly everything that needs to be disposed of, stored and protected.

West Virginia's packaging program is a total program which envisions the need for packages to meet a mass distribution trend enveloping not only industry, but also the retail shelves of supermarkets and discount houses. ☆

Your Scale Weights . . .

(Continued from page 26)

losses can be the result of short-weight and the attendant bad publicity of such charges. The cost factor is important when a shipment of materials needs to be reweighed, rebagged and reshipped after being sent back because of short-weight. While the conviction penalty for shortweight might be a minor cost, the loss in the added materials handling of the shipment can be staggering, wiping out altogether any thought of profit on the original package and, in fact, on a great many bags.

The cost in gross business loss cannot always be checked in terms of specific dollars-and-cents loss, but it certainly is costly if customers have the idea that they are not receiving full weight, no matter how it happens. Losses in customers have been estimated as high as 50 per cent in some known cases following short-weight convictions, and the attendant publicity.

TIPS ON SCALE CARE

Become "scale conscious." Be aware that scales, like all machinery, get out of whack, so have scales checked and tested frequently for accuracy.

Give scales reasonable care and maintenance. Never permit a scale to be overloaded. Never permit loads to be dropped on the scale. Have scale handlers place loads on the scale with care.

Keep your scales clean to avoid building up friction in the scale's inner working parts. Scales do not give warning when they are about to go bad. A scale may be tested and found accurate today. A month from now, it may begin weighing "slow," giving away too much of your product. Just because your scale indicator remains at zero when there is no load on the weighing pan does not mean it will weigh correctly. It only means that the scale is correct at the zero weight and, of course, there is nothing you weigh and sell at zero weight.

Don't use obsolete scales. The financial risks involved in weighing errors are too great. After all, the materials you weigh on your scales in the course of a year should be worth literally hundreds of thousands of times the cost of a new scale. Your scales are your "money machines." The pounds they weigh are literally worth money—your money! ☆

Training the Dealer . . .

(Continued from page 20)

counting firms, but that is not as desirable as it would be to have this done by line and by region and by size of dealership. The value of this information to the manufacturer is tremendous. From these figures he can select the best dealers. He can see when a dealer is getting into trouble, and when he is coming out of trouble. With such information, too, if he sees one of his dealers getting into trouble, he can send someone out to help this dealer. He should also, if the books are adequate, be able to spot the trouble and give the man some real help. This seems to me a much better service than having a salesman go out and buy him dinner and a bottle.

If the manufacturer can properly help his dealers, he will not have to worry about getting or keeping them. Recently, one of the firms for whom I do consulting came to me and asked if they should take on a dealership of a certain line. The first question that I asked was how are their other dealers doing. That was the last question we had to ask in this case. Four telephone calls later we had the answer.

In the near future you are apt to find yourselves in this position. You will be offering franchises and people will be asking, "Why?" If they are good merchants, they will ask for a list of dealers and will call four or five at random. They won't care for your suggestions of who to call either.

You may say, "Well, that's not the kind of dealers we want."

My reply is that that is exactly the kind you do want. You want dealers with sense enough to look before they leap. You also want hard-headed dealers working for you. This kind you can keep for quite a while and be sure your production will stay up. In the near future the manufacturer's survival will be measured in terms of the dealers. Fertilizer is moving into the competitive stage; when this happens, the *business* men survive. ☆

This familiar symbol represents the extra care that goes into . . .

SWIFT'S MINUTE MAN PHOSPHATES

Phosphate Rock—Ground and Unground Triple Superphosphate

Extra care at Swift's Phosphate Center means extra care in every stage of filling your needs . . . extra care in prospecting and mining . . . extra care in processing and quality control . . . extra care in scheduling and shipping . . . even extra care in record keeping.

It is the kind of extra care you get only from people who know they serve themselves best by serving you best, just as the Minute Man, who symbolizes Swift's phosphatic products, served himself by serving others.

You'll enjoy doing business with Swift's Phosphate Center . . . with dedicated people who want to serve you with extra care. Have a Swift Phosphate Center Representative outline the advantages Swift's service offers you in phosphates—triple, phosphate rock or ground phosphate rock.

THE SERVICE CENTER FOR ALL YOUR PHOSPHATE NEEDS

SWIFT & COMPANY
Phosphate Center • Bartow, Florida

Swift
PHOSPHATE CENTER

To Serve Your Industry Better WITH MINUTE MAN PHOSPHATE ROCK, GROUND PHOSPHATE ROCK AND TRIPLE SUPERPHOSPHATE

THE PESTICIDE OUTLOOK FOR '61

By R. W. YODER

THE PESTICIDE business is an important segment of the chemical industry. In 1960, at the basic manufacturer's level, the business amounted to 290 million dollars. It involved fifty basic manufacturers and about five hundred formulators operating regionally and nationally. And the products are marketed through distributors to the ultimate consumers in most cases . . . although this shows definite signs of changing. In some areas, the insecticide formulator is selling direct to the farmer.

The growth of the pesticide business has spurted as much from the increasing cost of farm labor as it did from the presence of pests. The cotton farmer, shifting from hand-picking to machine harvesting, needed some way of removing leaves before harvest . . . so chemical defoliants were developed. He needed an inexpensive way to control weeds . . . so herbicides were developed. There was first a need . . . and the pesticide business responded.

Potato growers needed a better method of maintaining protection against potato insects. Spraying the exterior of the plant with conventional chemicals required constant expensive repetition. American Cyanamid Company developed Thimet . . . a systemic insecticide that the plant absorbs, and which travels through the inside of the plant. It thus was automatically distributed to maintain over-all constant protection. In effect the plants bite back at the bugs. There was first a need . . . and again the pesticide business responded.

ANALYSIS AND PLANNING

We have to be ready to answer the needs of our customers . . . and we can do it only by analysis and planning . . . studying past experience and future trends.

There are at least eight factors that affect our business . . .

(1) Weather. Weather . . . insects . . . and plant diseases are the three great natural hazards of crop production.

(2) Enemy intelligence (Sounds pretty military . . . doesn't it . . . but I'll explain in a moment).

(3) General business conditions.

(4) Consumer factors.

(5) Farm population trends.

(6) Farm management practices.

(7) Government programs.

(8) Research and Development . . . there are at least eight different areas in which we *must* find answers.

Weather affects the forecast in many ways. Besides its direct effect on crops, it affects the enemies of the crops . . . the bugs . . . the blights . . . the weeds. A warm dry season will produce a heavy attack by insects, much less infection by diseases . . . a light crop of weeds.

A cool wet season will have opposite results. This was the case in 1960. Overall insecticide sales dropped compared with sales of fungicides and herbicides . . . herbicide sales jumped seven per cent over 1959.

Concerning my listing "Enemy intelligence" as a factor in planning. We have to know what the bugs are doing. We don't know what they have in mind . . . but we can find out how many bugs are in training and mobilized. One way we can do this is to check where they spend the winter.

They don't spend it in some ski lodge in Vermont or on a Caribbean cruise. But we do know their usual hiding place is in trash left in the field. Old corn stalks contain European corn borer . . . old cotton plants contain boll weevils . . . apple worms are under the bark of the apple tree. We are deeply indebted to entomologists at Federal and State experiment stations, whose efforts provide the necessary information about the overwintering of insect pests.

Well . . . our intelligence reports from this usual "reliable source" tell us to expect *lots* of corn borers and boll weevils this year. And that means . . . look for lots of insecticide sold in the Corn Belt and Cotton Belt.

From all indications, farmers are assuming we all intend to eat regularly. They don't want us to break the habit!

Plantings of fall vegetables are slightly above last year's acreage in the South. Their intentions elsewhere show little change from the normal level. And their attitude is sound . . . it amounts to "We're planting the crops . . . we expect you to want the food as you have in the past." When a farmer's committed himself by planting . . . he intends to keep the bugs off. And he'll buy the insecticide to keep 'em off!

WHAT ABOUT THE FARM BUSINESS PICTURE?

There's worry about the farm income problem . . . but plenty of farmers seem to be making money. In New Jersey? Much higher income in 1960 than '59. In Iowa? Higher than '59. Maine? Higher . . . Massachusetts? . . . higher. And the Department of Agriculture estimates 1961 income to run 5 or 6 per cent higher.

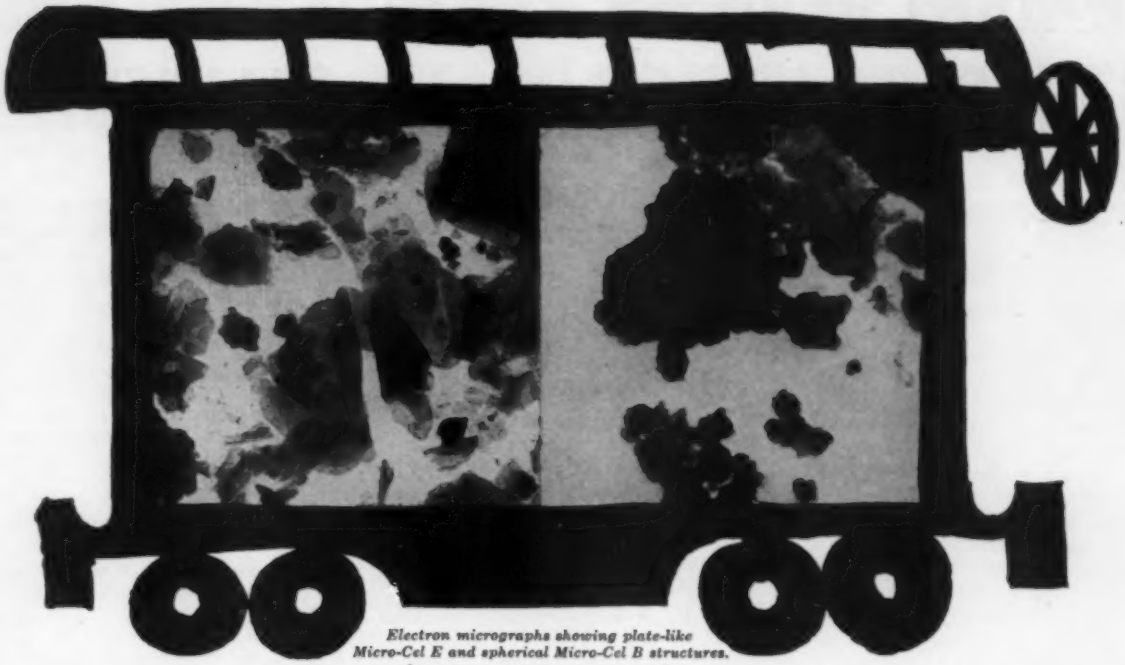
If you start feeling crowded pretty soon . . . don't worry. In 20 years there's going to be 80 million more of us in this country. We're going to be eating, wearing clothes . . . and moving to the suburbs. And those guys in the suburbs . . . what's their biggest worry? They're cussing crab grass, mosquitoes, the dog's fleas and the New Haven. But pesticides will lick only the first three problems. However, we are concerned about your transportation problems in another area and this we can do something about. I would like to read from a recent news clipping:

"One of the major safety problems facing the air transportation industry today is the task of ridding airports of nesting bird populations. Ingestion of birds into the engines of high-speed aircraft has resulted in at least one air crash in Boston and is a constant threat to air safety. Pesticides are considered a valuable tool in this problem, so reports the U. S. Fish and Wildlife Service.

"The proper use of selective weed killers to remove weeds and brush around airports and on the airports plus the addition of insecticides to the grassy areas of runways to control grubs and other soil inhabiting insects would reduce the attraction of the areas as a food source to birds."

Now these are non-farm uses. That non-farm market for pesticides is a sleeper . . . Watch it closely . . . One observer credits it with 15 per cent of the dollars spent on pesticides. That's a market to watch! ☆

**Pesticide Products manager, Agricultural Division, American Cyanamid Co. Condensed from a talk before the Commercial Chemical Development Association, March 16, in New York City.*



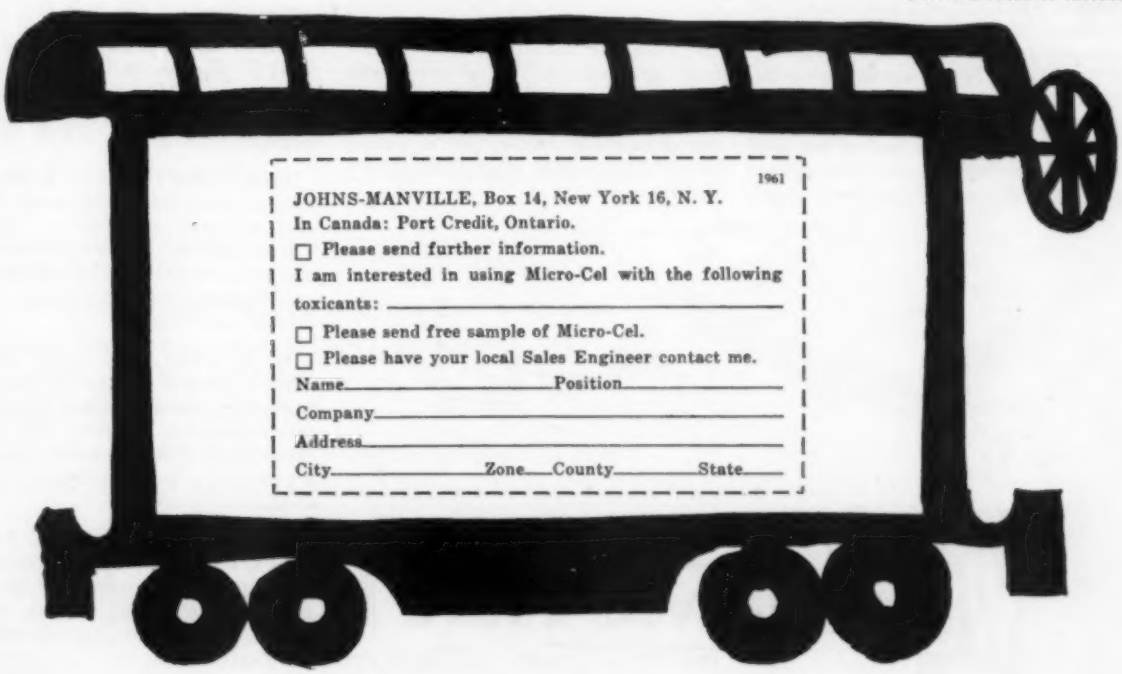
Electron micrographs showing plate-like Micro-Cel E and spherical Micro-Cel B structures.

1μ

Ship more toxicant per carload with Micro-Cel!

Micro-Cel®, Johns-Manville's inert synthetic calcium silicate, permits 75% DDT concentration. Other freight-saving, high toxicant concentrations include: 50% Chlordane, 70% Toxaphene, 50% Heptachlor, 75% Aldrin and 50% Aramite. Micro-Cel's unique structural characteristics (surface areas up to 175 sq. m/gr) reduce caking, improve flowability, increase suspendability and extend shelf life. For further information, samples and technical assistance, mail in the coupon below!

JOHNS-MANVILLE JM
Celite Division



1961

JOHNS-MANVILLE, Box 14, New York 16, N. Y.
In Canada: Port Credit, Ontario.

☐ Please send further information.

I am interested in using Micro-Cel with the following toxicants: _____

☐ Please send free sample of Micro-Cel.

☐ Please have your local Sales Engineer contact me.

Name_____ Position_____

Company_____

Address_____

City_____ Zone____ County_____ State_____

Triple Superphosphate Pelletizing Process

U. S. 2,965,472, issued Dec. 20, 1960 to Edward E. Huxley and William R. Pullin and assigned to Phillips Petroleum Co., describes a process for pelletizing triple superphosphate.

As shown below, triple superphosphate feed material is fed via line *5* to a crushing mill *6*. The discharge from the mill is conveyed to a classifier *8* where it is classified or screened. Classifier *8* is provided with a pair of vibrating screens *9*, *11*. Any over-size material that remains on the top screen *9* can be returned via line *12* to the mill *6*. The portion of the feed material which remains on the lower screen *11* represents coarse or seed material and this is conveyed via line *13* to a conveyor belt *14*. That portion of the feed material that passes through both screens *9* and *11* falls to the bottom portion of the classifier *8* and is discharged via line *16* onto a conveyor belt *17*.

The coarse triple superphosphate material is discharged from the seed material belt *14* into one end of a rotary drum or pelletizer *18*. Immediately after being discharged from the seed material belt *14*, the seed material is allowed to roll in the pelletizer and can then be sprayed with a controlled amount of water. The wet bed of seed material is allowed to roll a short distance from the point at which the seed material was introduced, and fines material is then discharged from fines belt *17* on to the top of the rotating bed of wet seed material.

At a point somewhat removed from the point at which the fines material was initially added to the bed of wet seed material, the bed is heated throughout the remainder of the pelletizer length by fuel line *19* having burners *21*. The bed temperature is in the range between 125 and 150° F. The heated rolling bed then forms a smooth round pellet or granule. The finished dry pelleted product is discharged via line *23* to storage or suitable bagging equipment. Alternatively, the product can be conveyed to a classifying unit *24* having vibrating screens *26*, *27*, and *28* by which the product may be classified to specification sizes.

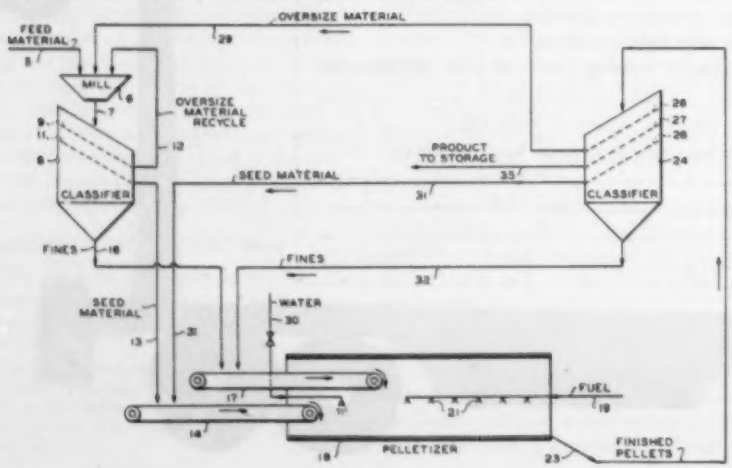
HERBICIDES AND PLANT GROWTH REGULANTS

U. S. 2,965,467, issued Dec. 20, 1960 to Francis X. Markley and assigned to Pittsburgh Coke & Chemical Co., describes a method of defoliating plants with an S,S,S,-tri-n-alkyl trithiophosphate in which each alkyl group contains 3-5 carbon atoms.

U. S. 2,967,101, issued Jan. 3, 1961 to Philip C. Hamm and Norman J. Lewis, assigned to Monsanto Chemical Co., discloses new plant defoliant compositions.

FERTILIZERS

U. S. 2,965,468, issued Dec. 20, 1960 to Derrick H. Stassfort, Everett N. Mortenson, and Marion D. Sanders, describes a process for the manufacture of mixed fertilizers. Sulfuric acid and ammonia are reacted to form ammonium acid sulfate. This is mixed with superphosphate, and enough ammonia-ammonium nitrate is added to convert the ammonium acid sulfate to ammonium sulfate and to ammoniate the superphosphate.



U. S. 2,965,471, issued Dec. 20, 1960 to Derrick H. Stassfort and assigned to Swift & Co., describes a method and apparatus for producing mixed fertilizers.

U. S. 2,966,394, issued Dec. 27, 1960 to Joseph Van Ackeren and assigned to Koppers Co., Inc. describes a process for recovering the ammonia from coke oven gas as large crystals of ammonium sulfate.

U. S. 2,966,395, issued Dec. 27, 1960 to Sergio Carbotti and assigned to Soc. Sali Potassici Trinacria, discloses a process of producing substantially pure potassium sulfate from kainite.

U. S. 2,967,615, issued Jan. 10, 1961 to Charles M. Goin and assigned to The American Agricultural Chemical Co., describes a process for concentrating phosphate-containing minerals.

PESTICIDES

U. S. 2,965,534, issued Dec. 20, 1960 to Walter A. Darlington and assigned to Monsanto Chemical Co., discloses a method of inhibiting the multiplication of plant viruses.

U. S. 2,965,536, issued Dec. 20, 1960 to Van R. Gaertner and assigned to Monsanto Chemical Co., discloses a method of inhibiting the development of rust on wheat, using a mixture of certain phenylhydrazine derivatives.

U. S. 2,965,537, issued Dec. 20, 1960 to Irving Rosen and assigned to Diamond Alkali Co., discloses the use of 2-halo-p-xylylene dithiocyanate as a nematocide.

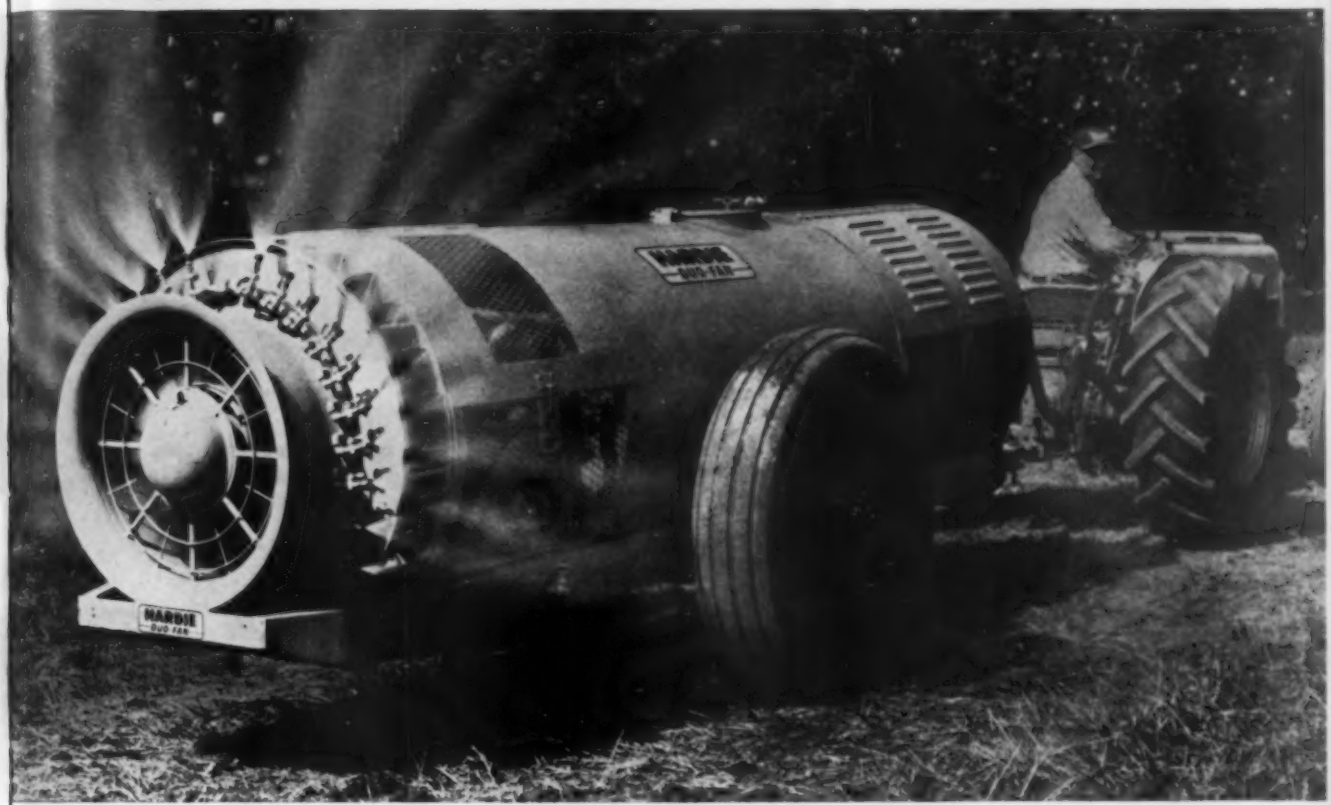
U. S. 2,967,100, issued Jan. 3, 1961 to Charles R. Phillips, Louis P. Greenberg, and Robert K. Hoffman, discloses a method of sterilizing soil with beta-propiolactone.

U. S. 2,967,123 and **2,967,124,** issued Jan. 3, 1961 to Sidney B. Richter and assigned to Velsicol Chemical Corp., discloses the use as an insecticide and miticide of dialkyl 2,2-di (o-o-lower alkylphosphorodithiosuccinate) and related derivatives.

U. S. 2,967,376, issued Jan. 10, 1961 to David B. Scott, Jr. and assigned to Soilserv, Inc., discloses a method of treating seeds to provide a free-flowing coated seed. The dry seed is mixed with a pesticide, a humectant, and a coating conditioning material.

U. S. 2,967,377, issued Jan. 10, 1961 to Glenn A. Brown, describes compositions and a process for the treatment of Dutch Elm Disease, using a suspension of sulfur, tartaric acid and other substances.

FARM CHEMICAL TANKS SHOULD BE MADE OF Ingersoll STAINLESS-CLAD STEEL



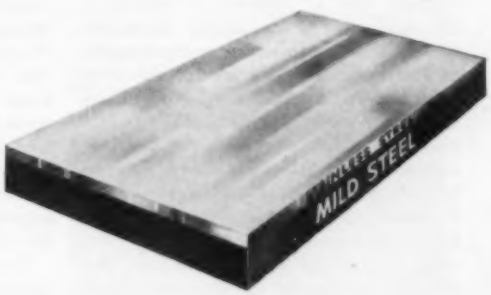
Hardie Duo-Fan Air Blast orchard sprayer with tank made of IngAclad Stainless-clad Steel

WHY?

Because highly corrosive farm chemicals cannot attack the stainless steel lining made of Ingersoll IngAclad *stainless-clad steel*

HERE ARE THE FACTS:

1. IngAclad stainless-clad steel is priced approximately 28% less than solid stainless steel.
2. Stainless-clad steel tanks outlast ordinary steel tanks by many, many years.
3. 20% of the total sheet thickness is Ingersoll stainless steel.
4. The stainless layer is type 304 (18-8) Stainless.
5. Leading sprayer manufacturers are now specifying IngAclad steel for their chemical sprayer tanks.



(Ingersoll is the only manufacturer of single-clad stainless-clad steel sheets.)

Send for a Free Sample of IngAclad Steel and a copy of our new Facilities and Products Brochure.

Ingersoll STEEL DIVISION
Borg-Warner Corporation
NEW CASTLE • INDIANA

INGERSOLL B-W STEEL
BORG-WARNER

TECHNICAL REVIEW

Before and after weed control. At right is the A. R. McFaddin Pond, Gable, South Carolina. Floating Najas covered 85 per cent of this 25-year old, three-acre farm pond from bottom to top. Average depth is three feet. On the facing page, the same pond is shown, weed-free. One hundred per cent weed control was achieved in 25 days. The Najas was controlled with 1 ppm Aquathol, sprayed on the surface with a three gallon knapsack sprayer. Fishing was unaffected. Tobacco and corn plots were irrigated 24 hours after treatment at the rate of 6000 gallons per acre and did not show any noticeable ill effects.

Low toxicity herbicide opens "NEW FRONTIERS" *in A*

By HAROLD J. MILLER*

AFTER five years of research and field tests, Pennsalt Chemicals Corporation has introduced an aquatic herbicide free from most of the objections which restrained the use of those previously on the market. The new product is to be distributed under the trademark, Aquathol. It has created real excitement among weed control specialists because it not only gives good control of many aquatic weeds but has the advantages of rapid disappearance, a wide margin of safety to fish and other aquatic fauna, a low chronic level of toxicity, no hazard to the applicator if the simple directions on the label are followed, and economy.

The need for such a product has long been known. Aquatic weed control has been a particularly acute problem in recreational areas where power boating, swimming and fishing is popular. Interference with boating and water skiing is troublesome along shores of most lakes where weeds can greatly reduce the efficiency of an outboard motor. The nuisance caused by weeds in swimming areas is obvious.

The same problems have been even more acute in farm ponds. Generally in relatively fertile agricultural soil, these ponds have offered a particularly favorable environment for growth of aquatic weeds. Of this, Charles Walker of the Missouri Conservation Commission has said, "The majority of farm ponds have or will have a weed problem due to their fertility, shallow nature and other factors which promote a weed problem." Other observers have estimated that almost all established farm ponds have a weed problem and that with new ponds a problem will usually develop within a period of about four years.

To those using farm ponds for fish production, the relation of aquatic weed growth to reduce fish production, particularly of bass, blue gills and other spiney rays, is of great importance, as it is also to the hatchery people and fish farming specialists. The shading effect of aquatic weeds reduces the growth of vital phytoplankton necessary for fish food. The weeds also provide excessive cover for the fry on which the larger fish feed resulting in stunting and an imbalance of fish sizes in the water. Removal of the weeds, therefore, results in greater fish production and this is particularly true in small lakes and ponds.

Weed growths of various types have always been a problem in irrigation ditches, canals, reservoirs and holding basins. They interfere with the proper flow of water, clog pumps, and seriously impede the efficiency of irrigation practices.

Various methods have been tried to obtain aquatic weed control but only destruction by chemicals has been really practical. Sodium arsenite has been successfully used for many years. The proper procedure for its use has been summarized by K. M. Mackenthun in a paper entitled "The Chemical Control of Aquatic Nuisances" presented before the committee on water pollution at Madison, Wisconsin in 1958. In spite of its toxicity hazards to fish and mammals, sodium arsenite is probably the most widely used of all chemical aquatic herbicides. It has been particularly successful when carefully applied with proper equipment.

Many other herbicide chemicals have been found to possess activity against aquatic weeds including some, such as xylene, which show no activity against terrestial plants. Most of these have found limited use because of one factor or another. One of the most common difficulties has been fish toxicity hazards.

APPLICATION RATE

The necessity when using chemicals in water to calculate the dose on a depth basis rather than simply the surface areas, as is done with regular chemical weed control, makes it more difficult to control the range of application. Since it is necessary to apply a chemical in such a way that the submergent (and partly emergent) weed growth will be uniformly exposed to the chemical, it is important to determine both area and depth. Because of this errors in the rate of application often result not only in poor pond weed control by underdosing but also, and more important, in the case of chemicals with a narrow margin of fish tolerance, the loss of fish.

*Supervisor, Agricultural Chemicals Section, Technical Development Department, Pennsalt Chemicals Corporation, Tacoma, Washington.

n Aquatic Weed Control

The herbicidal properties of Aquathol (which chemically is disodium endoxohexahydrophthalate), were discovered in 1948. Its use in preemergent applications for weed control in sugar beets has been described in various articles. A field test on its effectiveness for aquatic control has been in progress since 1957.

LAB STUDIES SHOW SAFETY

It was determined early in controlled laboratory studies that Aquathol was unusually safe on fish. No toxicity was observed on bass, blue gills, trout and salmon with doses as high as 100 parts per million of actual chemical. This encouraged further work in weed control with Aquathol since it could be used with a wide margin of safety in waters where fish occurred.

Weed control studies next were directed toward finding the concentration required for weed control and which kinds of weeds were most effected. Aquathol was found to be active on some weeds at the remarkably low doses of 1/3 part per million and many weeds were controlled at doses varing from 1 to 3 parts per million. The table below summarizes a few of the results obtained.

Although Aquathol has not been successful in eliminating all aquatic weeds, it has proved effective against a rather broad spectrum. Field studies in various areas of the United States and Canada

(Continued on page 56)

TABLE I—Results of Some Tests with Aquathol for Aquatic Weed Control

Location	Formulation	Rate	Date Applied	Date Observed	Weeds	Control
New Orleans, Louisiana	Liquid	½ ppm 1 ppm 2 ppm	5-7-59	6-18-59 6-18-59 6-18-59	Coontail & water star grass	90% 90% 90%
West Brooklyn, Illinois	5% Granular	0.9 ppm	7-27-59	8-17-59	Sago pond weed & water milfoil	90%
West Brooklyn, Illinois	5% Granular	1.2 ppm	6-20-60	7-18-60	Sago pond weed	90%
Sublette, Illinois	Liquid	1 ppm	7-18-59	9-8-59	Sago pondweed, curly leafed pondweed, and water milfoil	100%
Pasadena, California	5% Granular	1.5 ppm	6-14-60	7-20-60	Horned pondweed	100%

Normal 8" Bluegill with stunted 2 year old Big Mouth Bass and Black Crappie seined from a weed infested private fish pond in Western Oregon. *(Photo courtesy H. P. Carsner.)*

Normal 2 to 3 year old Big Mouth Bass taken from properly managed fish pond in Western Oregon. *(Photo Courtesy H. P. Carsner.)*

Examining results of a Washington lake weed treating program are Henry P. Carsner, consulting biologist, and the author, Dr. Miller. This lake treatment was made possible under a recent State of Washington enabling act which permits such programs to be conducted and establishes procedures for determining reasonable costs and sharing by property owners.

Small airboat used for large area control of aquatic weed, "swimmers' itch." *(Photo courtesy H. P. Carsner.)*

Wet Process Acid of Highest Quality
52-54% P_2O_5
Solids less than 1% by weight

For ALL Phosphates Used In High Analysis Fertilizers

FIRST CLASS
Permit No. 67
Sec. 510, P. L. & R.
Willoughby, Ohio

o Postage Stamp Necessary If Mailed in the United States

POSTAGE WILL BE PAID BY

FARM CHEMICALS

Willoughby, Ohio

READER SERVICE DEPARTMENT, FARM CHEMICALS

Please send me the following publications (Circle Item No.):

114	116	118	120	122	124
115	117	119	121	123	125

5-61

New Products

126 128

127 129

Name.....

Title.....

Company.....

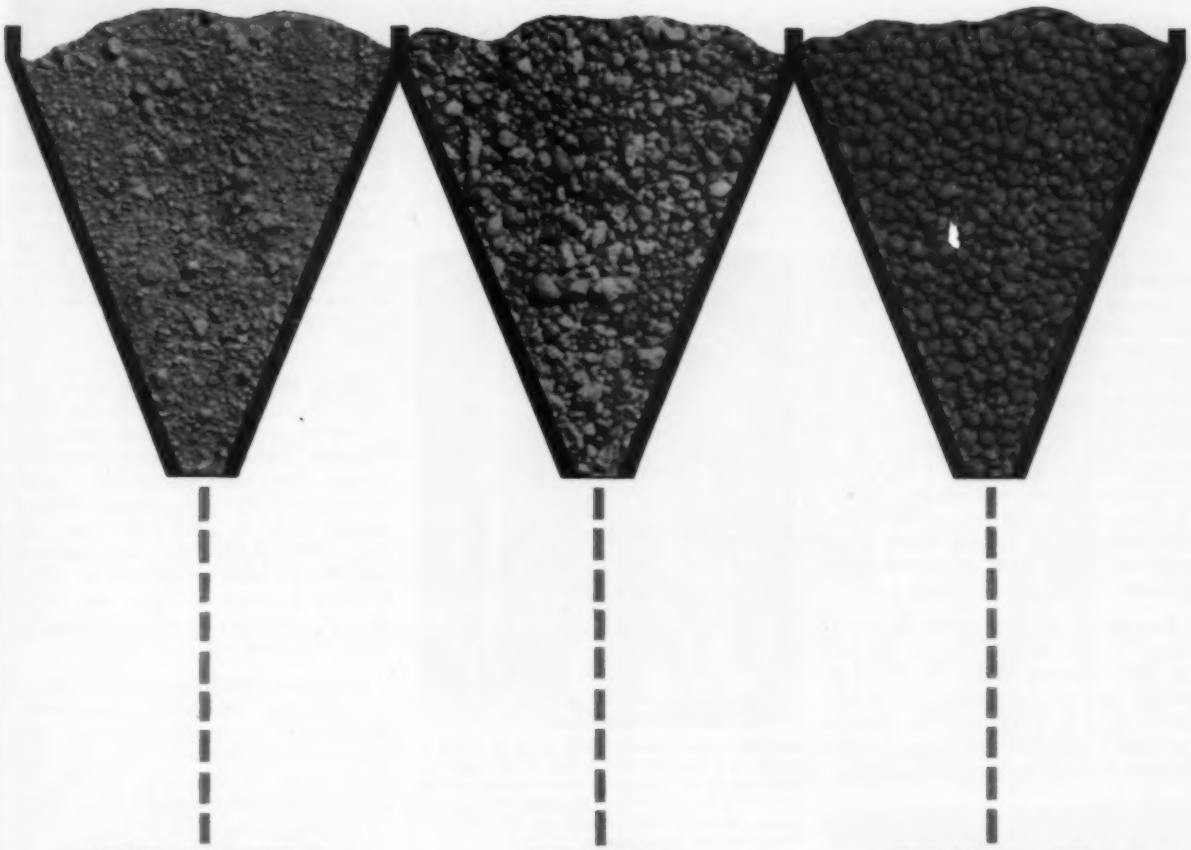
Address.....

City & Zone.....State.....

This Card Void After July, 1961

USPP

TRIPLE SUPERPHOSPHATE



For Requirements – Contact Our Sales Agents

BRADLEY & BAKER
155 East 44th Street,
New York 17, New York
Telephone: MUrrayhill 2-5325

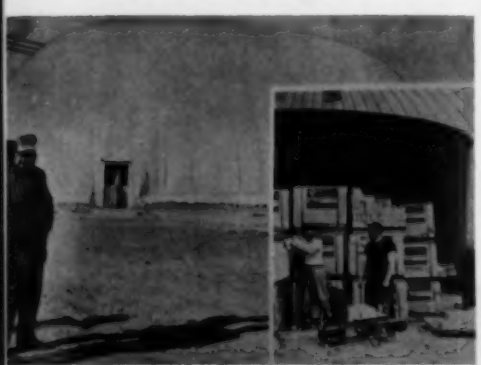
U.S. PHOSPHORIC PRODUCTS
TAMPA, FLORIDA
Division of
TENNESSEE CORPORATION

A license to build a proposed $51 million fertilizer plant on the east coast of India has been granted **International Minerals & Chemical** Corp. and **California Chemical** Company along with an Indian company, E. I. D. Parry group, by the Indian government. The plant would produce about 350,000 tons of chemical fertilizers annually. Presidents T. M. Ware of IMC and Fred Powell of Cal Chem said that with the granting of the license complete feasibility studies on the proposed operation will be undertaken.

In Connecticut, fertilizer sales fell sharply in 1960, due in part to the decrease in tobacco acreage as compared with 1959, according to the Connecticut Agricultural Experiment Station. Mixed fertilizers accounted for 80 per cent of the 70,866 tons of materials and mixed goods used in the state last year.

The Norfolk chemical plant of the **Smith-Douglass Co.** recently received a banner as American League 1960 Safety Ball Contest Winner. A banner is presented to the operation that earns the highest number of points in each of the three leagues in the contest. Points are earned for each monthly safety meeting, monthly fire drill and weekly safety inspection held and one-tenth of a point for each man hour worked and reported. Points are lost for each medical case, lost-time accident or each death of an employee as the result of an industrial accident.

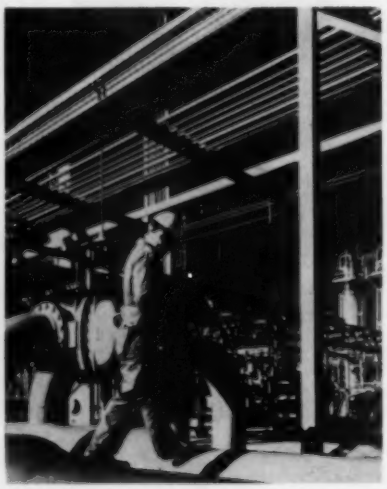
Purchase of the Wichita Fertilizer Co. facilities at Wichita, Kansas, has been announced by W. N. Watmough, Jr., vice president for mixed fertilizers of W. R. Grace & Co. Davison Chemical Division. Davison has been in business for many years in Kansas.



Inside 70°F.—outside below zero. This gigantic plastic bubble—kept inflated by two air blowers—enabled Olin's Blackson operation to continue construction of a new phosphoric acid facility at Joliet, Ill., throughout the winter months. Made of nylon coated with Hypalon, the bubble is 70 feet wide, 100 feet long and 35 feet high.

The **Brazilian Coffee** Institute has developed a fertilizer of coffee meal cake and phosphate. The meal, which results from extraction of coffee oil and caffeine from "expurgo" (sacrifice quota) coffee, is mixed with an equal proportion of phosphate. The fertilizer is sold at plants of the coffee oil crushers in the state of Sao Paulo at cr$2.5 per kilo (slightly more than ½ cent a pound). Although the Institute reportedly has 60,000 metric tons available for sales, the demand is not expected to exceed 40,000 tons in 1961.

Du Pont Co. has announced start-up of a new plant at its Belle, W. Va., site to make methylamines and their derivatives, chemicals used in making textile, rubber and agricultural products, rocket propellants and pharmaceuticals. Among the products the plant will produce are fungicides and 2,4-D herbicides.



The Nitrogen Products Div. of W. R. Grace & Co. is on stream with 60,000 tons of new ammonia capacity at its Memphis, Tenn., plant, reports William J. Haude, division president. Overall ammonia capacity of the nitrogen plant is now more than 160,000 tons annually.

Construction began last month on **Consumer Cooperative** Association's 8 million dollar anhydrous ammonia fertilizer plant at Hastings, Neb. R. R. Zurbuchen, general manager of the Cooperative Farm Chemicals Association at Lawrence, Kan., is supervising construction of the plant for CCA. Chemical Construction Corp. is the general contractor. Zurbuchen expects the plant to be in operation by November 1.

Shell Oil Co. will build a gas processing and sulfur plant in the Bryans Mill gas field, Cass County, Tex., and expects to have it on stream by years' end.

GasprO, Ltd. has installed an herbicide mixing plant at Hilo, Hawaii, to formulate 2,4-D and other amines. GasprO, recently named Amchem Products formula agent for Hawaii, plans to extend its chemical business to cover all the Islands.

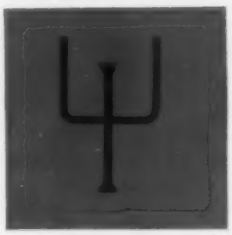
Six-year safety award is presented to Federal Chemical Co.'s Louisville Production Manager Jay Marshall (center) by Lester Loving, Aetna Casualty & Surety Co. (right) as Federal Production Engineer John Surber looks on. On March 21, the record stood at a total of 2277 days without a lost-time accident and represents better than 500,000 total manhours.

New Mexico farmers set a new record in the use of fertilizers in 1960, according to G. B. Hoff, extension agronomist with New Mexico State University. They used 45,307 tons of fertilizer on 355,000 acres of crops. Overall amount used in 1960 was 9 per cent above 1959 and 333 per cent more than the 13,649 tons purchased in 1950. Leading nitrogen fertilizer was anhydrous ammonia, and most popular mixed fertilizer was 16-20-0.

Nitrogen Division, Allied Chemical Corp., has announced a **new pricing** system for its urea products. The change affects fertilizer, feed and industrial grades of urea. For agricultural grades, 45% only, bagged full truckload or carload price is $92.50 f. o. b. plant or, at seller's option $96.00 freight allowed, or at seller's option, delivered cost equalized with competitive producing points. Bulk prices are $86.50 and $90.00, respectively.

A $3.5 million contract has been awarded by **Potash Co. of America** to Stearns-Roger Manufacturing Co. of Denver for extensive modernization of the Carlsbad, N. M., plant. Construction is scheduled to begin this month, and completion is expected in the summer of 1962. Capacity of the granular flotation unit will be doubled and a new flotation system for the balance of the ore processed is to be installed. PCA said the program is aimed at improving processing efficiencies and also to permit mining of some ores now too difficult to handle.

SYMBOLS OF PLANT LIFE



*

During the centuries of medieval persecution and the attempted suppression of learning, every alchemist invented his own secret symbols even in experimenting with potash.

TODAY, THERE IS NO SECRET ABOUT THE ESSENTIAL ROLE POTASH PLAYS IN MIXED FERTILIZERS . . . HOW IT CONTRIBUTES TO THE PRODUCTION OF QUALITY CROPS.

SOUTHWEST POTASH CORPORATION PROVIDES MIXERS WITH A DEPENDABLE SUPPLY OF HIGH K$_{T.M.}$ MURIATE . . . STANDARD, COARSE AND GRANULAR . . . FOR THE PLANT FOOD INDUSTRY.

15th Century Alchemy process

SOUTHWEST POTASH CORPORATION

1270 Avenue of the Americas, New York 20, N.Y.

HIGH-K

*Another 15th Century Symbol for Potash

The elemental method of expressing fertilizer nutrients, including minor elements, will be used in the research and educational journals of the Soil Science Society of America and American Society of Agronomy, beginning with the January 1962 issues. Authors will be permitted to include the oxide expressions along with elemental analyses.

The Government of Israel has decided to sell the majority of government-owned shares in **Fertilizers & Chemicals Ltd.** to the **Israel Investors** Corp., an American company registered in the U. S. IIC will buy the shares for its own portfolio and also make them available to the public. The U. S. investment involved will amount to about $10 million.

Commercial Solvents Corp. has opened a West Coast office at Agnew, Calif., six miles from San Jose. This is also the site of CSC's West Coast plant. The new office will serve as headquarters for the company's sales operations in agricultural, industrial and pharmaceutical chemicals and animal nutrition products.

California Chemical Co. has awarded a contract to **Chemical & Industrial** Corp., Cincinnati, Ohio, for construction of a complex dry fertilizer plant at Fort Madison, Iowa. The new 600-ton-per-day plant combines the C&I spherodizing process with the French PEC slurry process to make a completely homogenous pellet, California Chemical said. It is scheduled for completion in the fourth quarter of this year.

The company said the new plants mark the further development of California Chemical, through its Ortho Div., as basic producers and marketers of fertilizers in the Midwest and Northeast.

Bob Homan, left, Westville, Ind., was one of 23,833 farmers who signed a Spencer Chemical Co. fertilizer "pledge" recently. He emerged as Grand Prize winner and as a result will receive about 40 tons of plant food for use on his 306-acre farm. Homan is shown discussing his fertilizer plans with C. N. Boehlke of the Wanatah Mercantile Co. Boehlke figured prominently in the prize since he persuaded Homan to sign the contest entry which asked farmers to pledge to consult their fertilizer dealer about proper plant food use.

Calendar

May 7-10. American Institute of Chemical Engineers and Chemical Engineering Div. of Chemical Institute of Canada, joint meeting, Sheraton-Cleveland Hotel, Cleveland, Ohio.

May 10-12. American Institute of Chemists, annual meeting, Statler Hotel, Washington, D. C.

May 15-17. Chemical Specialties Manufacturers Association, midyear meeting, Drake Hotel, Chicago.

May 17-18. Chemical Market Research Association, annual meeting, Plaza Hotel, New York City.

June 5-7. Association of Southern Feed, Fertilizer and Pesticide Control Officials, annual meeting, Lafayette Hotel, Lexington, Kentucky.

June 5-8. International Instrument-Automation Conference and Exhibit, Toronto, Canada. Conference sessions at Royal York Hotel, exhibit at Queen Elizabeth Hall June 6-8.

June 8-10. Manufacturing Chemists' Association, annual meeting, The Greenbrier, White Sulphur Springs, W. Va.

June 11-14. National Plant Food Institute, annual convention, The Greenbrier, White Sulphur Springs, W. Va.

June 18-21. Eastern Section, Canadian Society of Agronomy; Eastern Membership, Canadian Soil Science Society; Northeast Branch, American Society of Agronomy, joint meeting, Redstone Campus, UVM, Burlington, Vermont.

June 27-29. 12th Annual Pacific Northwest Regional Fertilizer Conference, Marion Motor Hotel, Salem, Ore.

July 5-7. Midwest Branch, American Society of Agronomy, meeting, University of Wisconsin, Madison.

July 19-21. Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Tex.

August 16-20. Canadian Fertilizer Association, annual convention, Manoir Richelieu, Murray Bay, Quebec.

August 29. Agricultural Engineering Field Day, Brookings, South Dakota.

October 9-11. Western Agricultural Chemicals Association, annual meeting, Hotel Claremont, Berkeley, Calif.

October 29-November 1. National Agricultural Chemicals Association, 28th annual meeting, The Homestead, Hot Springs, Virginia.

November 2-3. Pacific Northwest Plant Food Association, annual convention, Hotel Gearhart, Gearhart, Ore.

November 6-7. Washington State Weed Association, annual weed conference, Chinook Motel & Tower, Yakima, Wash.

November 8-10. Fertilizer Industry Round Table, Mayflower Hotel, Washington, D. C.

November 12-14. California Fertilizer Association, 28th annual convention, Jack Tar Hotel, San Francisco, Calif.

January 17-19, 1962. Southern Weed Conference, Hotel Patten, Chattanooga, Tenn.

People

Allied Chemical's General Chemical Div. reports two key agricultural research appointments. Merrill M. Darley has been named manager of agricultural research and Leonard H. Dhein succeeds Darley as technical supervisor of agricultural research.

American Potash & Chemical Corp. has appointed Edward O. Carlton sales representative with headquarters in Kansas City, Mo. and Leonard L. Lyle sales representative at the Shreveport district office.

Amoco Chemicals Corp. James R. Eiszner, R. Wayne Yelverton and Robert D. Sieron have been named to newly created positions in the Marketing Department. Eiszner is director market development—chemicals; Yelverton is director market development—polymers and Sieron is director market development—hydrocarbons.

California Chemical Co., Ortho Div. E. C. Redepenning, formerly manager of personnel for California Spray-Chemical, becomes counsel, personnel development, in the California Chemical Employee Relations Div. The division is occupying new quarters on the 12th floor at 200 Bush Street, San Francisco.

David L. Barton has been named chief engineer for Ortho, and Robert J. King becomes administrative assistant to the manager—manufacturing.

Phil S. Williams has retired as vice president, director and chief engineer, but will remain at Cal Chem headquarters in San Francisco as consultant until the Ortho plant food plant under construction at Fort Madison, Iowa, is put into operation late this year.

Campbell Fertilizer Co. J. A. Tennant, Jr., has been named president, succeeding G. H. Seibel, temporary president, who now is vice president in charge of manufacturing.

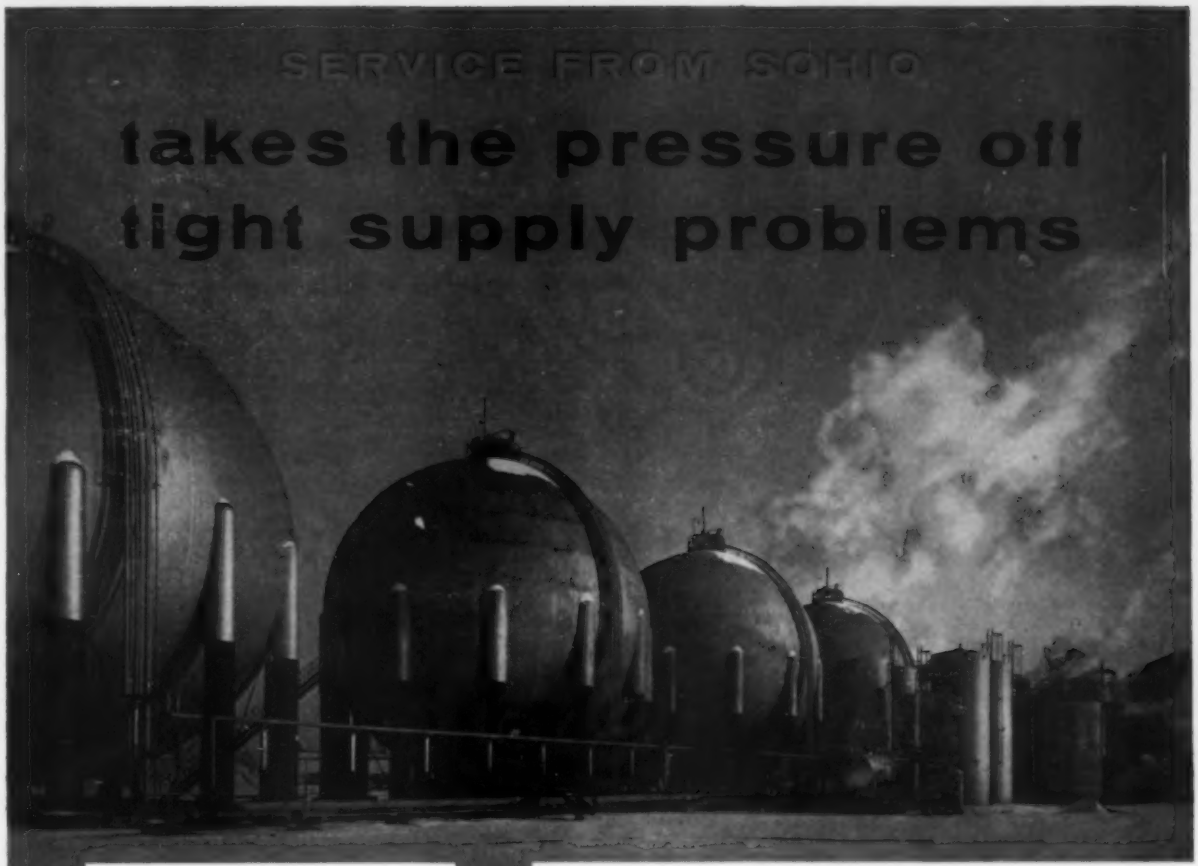
Chemagro Corp. New general sales manager is F. R. Johnson, formerly assistant director of sales. Thomas J. Lorenz has been named assistant to the general sales manager.

Food Machinery and Chemical Corporation. Dr. W. L. Riedeman has been named supervisor of the Organic and Polymer Dept. of the Research and Development Center, Princeton, N. J. The center has also added Dr. Elliott Farber as a research chemist.

John Deere Chemical Co. Dr. L. E. Craig has been named to the new post of director of research and technical service. He will be in charge of all phases of

SERVICE FROM SOHIO

takes the pressure off tight supply problems



Sohio's storage facilities — largest in the country in relation to production capacity — keep nitrogen materials on tap for your peak season needs.

• • •

Sohio pioneered, and now sets new standards for speedy truck delivery of nitrogen materials.

A-8

SOHIO

WHEN you order nitrogen materials you naturally expect quick-time service and delivery. And that's just where Sohio shines.

Sohio's storage facilities — a continually expanding array of storage spheres, tanks and warehouses — provide an adequate inventory of nitrogen materials to meet your rush-season demands. Like clockwork, Sohio materials move out on the 5 rail lines serving the Sohio plant at Lima. Truck fleet delivery, developed by Sohio, gives you the fastest delivery possible.

A complete line of Sohiogen® Solutions, anhydrous and aqua ammonia and Sohigro® Urea meets your every requirement . . . gives you the full-range flexibility you need in manufacturing high-analysis finished goods.

These "ingredients" of Sohio SERVICE just can't be duplicated. Call the "Man from Sohio" today for details on how you can benefit from Sohio Service.

See Sohio first for high quality anhydrous ammonia—aqua ammonia—coated 45% or uncoated 46% urea—and 18 nitrogen solutions, including those containing urea. You want it—we have it.

. . . we're serious about SERVICE at Sohio

SOHIO CHEMICAL COMPANY

Agent for Solar Nitrogen Chemicals, Inc.

Fort Amanda Rd., P.O. Box 628 • Lima, Ohio
Phone CApitol 5-8015 or wire (TWX call letters LIMA O 497-U)

research and technical service for both the Pryor and Tulsa plants.

Ercegovich

Geigy Agricultural Chemicals, division of Geigy Chemical Corp., has appointed Dr. C. D. Ercegovich as staff biochemist. He goes to Geigy from the Tennessee Corp. Research Laboratory in College Park, Ga. His specialty has been in the field of agricultural fungicides with main emphasis on copper compounds.

Hooker Chemical Corp.'s board of directors has elected Thomas E. Moffitt chairman of the board and chief executive officer. Succeeding him as president is F. Leonard Bryant. Thomas F. Willers replaces Bryant as executive vice president.

International Minerals & Chemical Corp. S. A. Scott has been appointed chief mining engineer and Frank C. Pickard manager of prospect development in the Mining and Exploration Dept. of IMC. Dr. Donald H. Freas becomes geologist and David M. Williams mining engineer.

Merck Chemical Div. Dr. Luther S. Roehm has been elected vice president for marketing of the division by the board of directors of Merck & Co., Inc. Roehm had been a vice president of A. E. Staley Mfg. Co.

Monsanto Chemical Co. has appointed Allen F. Davis product supervisor of phosphatic fertilizer solutions in the marketing department of the Agricultural Chemicals Div.

Niagara Chemical Div., Food Machinery and Chemical Corp. Franklin R. Hall joins the firm as field service representative to arborists and fruit-vegetable growers in central Massachusetts and Rhode Island.

Olin Mathieson Chemical Corp. William Block, vice president and manager of the Chemical Division's Blockson operations, has retired, it was announced by John O. Logan, vice president and general manager of the Chemical Division.

The Sulphur Institute. Dr. Moyle S. Williams, director of economic research, is on a six-month tour of duty as a special consultant to the Food and Agriculture Organization of the United Nations, and is stationed at FAO headquarters in Rome. He has been granted a leave of absence from the Institute staff.

Pisle

Sohio Chemical Co. recently announced that Russell I. Pisle has assumed new duties as staff assistant to James W. Bibbins, agricultural sales manager. Pisle has been replaced in the Ohio sales territory by T. P. Mericle, formerly an agricultural salesman in the Southern territory.

Jacob

Southwest Potash Corp. Kenneth D. Jacob, specialist in fertilizer technology, joined the company as a consultant. Jacob retired earlier this year as special assistant to the director of Soil and Water Conservation Research Div. of USDA. He has been engaged in fertilizer research since 1919.

Texas Gulf Sulphur Co. Arthur Gloster joins the firm as assistant manager of research. He had been chief engineer of Titlestad Corp.

Giraudi

Witco Chemical Co., Inc. has announced election of Dr. Carlo Giraudi as vice president in charge of research, development and engineering. His responsibilities extend to all Witco divisions and subsidiaries. He had been vice president and technical director of Ultra Chemical Works, Inc., a Witco subsidiary.

Chemicals

Three new Crag Agricultural Chemical formulations for face fly control have been put on the market by Union Carbide Chemicals Co. Two are ready-to-use formulations with Crag fly repellent combined with pyrethrins and piperonyl butoxide in a white mineral oil base. The mixture for smear application and the spray-on formula are in liquid form. The third formulation is an all-purpose emulsifiable concentrate which kills and repels horse flies, stable flies, deer flies, house flies, mosquitoes and gnats as well as face flies.

Guthion insecticide has been registered for use on grapes to control grape berry moth, leafhoppers and mites, reports Chemagro Corp., its manufacturer.

Stauffer Chemical Co. is introducing **Methyl Trithion,** a new cotton pesticide which controls both insects and mites. The compound has proved to be effective in controlling cotton pests such as the boll weevil, cotton aphid, fleahoppers and the cotton leafworm, Stauffer says. When used in repeated sprayings to combat these pests, it also gives good control of spider mite. In combination with DDT, Methyl Trithion is reported to be an effective control agent for bollworm, pink bollworm, lygus bug and thrips.

A new experimental seed and soil fungicide, **Hercules 3944,** that shows promise in field tests on cotton, field corn, peanuts and vegetable seeds as well as a soil treatment for cotton and other crops, was described at the American Chemical Society national meeting in St. Louis recently by Dr. William R. Diveley, Hercules Powder Co.

In two years of laboratory and field tests, the fungicide has shown its ability to control an unusually broad spectrum of soil-borne diseases of a variety of vegetable and field crops in addition to a wide selection of pathogens causing seed decay, Dr. Diveley said. The chemical appears to have a low order of toxicity to mammals. Based on cumene, the fungicide will be subjected to extensive tests again this year.

Dibrom, a new phosphate insecticide, has been granted a United States patent, according to L. R. Gardner, manager of research and development of Ortho Div., California Chemical Co. Named as inventors are Ortho research scientists J. N. Ospenson, lead research chemist, and G. K. Kohn, chief research chemist.

Dibrom has been in use for some time and is registered on a no-residue basis for use up to four days before harvest on most crops. Cal Chem says it kills more than 130 different species of insect pests by contact action in a matter of minutes.

A NATURAL QUALITY PRODUCT
SHIPPING POINT PLANTS HACKLEBURG, ALABAMA
USE WITH CONFIDENCE
TAKO
QUALITY AND SERVICE SINCE 1939
AIRFLOATED BAGGED OR BULK
GUARANTEED LESS 1% FREE MOISTURE
USE "TAKO" Airfloated Colloidal Kaolinitic Kaolin, Fertilizer Grade, excels as a coater-conditioner of granulated or prilled high analysis and mixed fertilizers. Large tonnage used year after year. COSTS SO LITTLE — DOES SO MUCH.
THE THOMAS ALABAMA KAOLIN COMPANY 2412 KEN OAK ROAD BALTIMORE 9, MARYLAND

The Big Pull . . .

A magazine that's a work manual, professional journal, and graduate course for the intelligent and ambitious businessman farmer, SUCCESSFUL FARMING *in every issue has farmer experience stories—actual case histories of planting, automatic feeding, materials handling, livestock, pest control, and commercial fertilizer applications . . .*

SUCCESSFUL FARMING has the big pull ...delivers influence and prestige based on 59 years of service, helping readers earn more money, increase output, yields, and profits, conserve soil and nutrients.

It is a medium that is not merely leafed through, looked at, discarded—but read, studied, used, clipped, filed, referred to again by one of the world's choicest class audiences.

SUCCESSFUL FARMING farmers are big businessmen with big farms, averaging more than 300 acres—50% larger than in 1945.

They have money and substance. Their estimated annual average cash farm income for more than a decade has been about 70% above the national farm average.

SF farm chemicals advertisers reach more than 1,300,000 of the nation's best farmers in the National Edition—and 12 State & Regional Editions offer infinite flexibility, fit individual marketing plans, step-up impact, give dealers more support, do seasonal selling, copy testing, or new offer tryouts. Price can be featured, and dealers and distributors listed.

All editions give the farm chemicals advertiser all the SUCCESSFUL FARMING advantages—editorial excellence, long life, quality reproduction—sell commercial fertilizer and pesticides in volume.

Ask any SF office for full facts!

MEREDITH PUBLISHING COMPANY, Des Moines . . . *with offices in* New York, Chicago, Atlanta, Boston, Cleveland, Detroit, Los Angeles, Minneapolis, Philadelphia, St. Louis, and San Francisco.

Government

"Insecticide Recommendations of Entomology Research Div. for Control of Insects Attacking Crops & Livestock for 1961." That's the title of Agriculture Handbook 120, issued by USDA. It details recommended safe uses for chemicals that protect crops and livestock. The recommendations are intended as a guide for entomologists, for other research and extension workers and for various agricultural associations and agencies, rather than for individual farmers, USDA says. Single copies may be obtained for 65 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

USDA's **Dr. Harold H. Shepard** supervised the agricultural chemicals display of the U. S. Exhibit at the International Agricultural Exhibition in Cairo, March 21-April 21. J. K. McClarren, of USDA's office of information, was director of the program and content group for the entire U. S. exhibition.

Some species of **insects in stored grain** can be killed by a few seconds' exposure to high-frequency electric fields, according to USDA. In recent studies at Manhattan, Kans., and Lincoln, Neb., insects in stored wheat and wheat shorts were exposed to high-frequency electrical treatments of different frequencies and field intensities to determine their effect on mortality and reproduction of the insects. Use of high-frequency radio waves for killing insects is not new, USDA said, but more information was needed on their effects on insects in stored grain.

Details of the experiments are given in a 52-page report, "Effects of High-Frequency Fields on Certain Species of Stored-Grain Insects," Marketing Research Report No. 455. A free copy may be obtained from the Office of Information, USDA, Washington 25, D. C.

Suppliers Briefs

Bemis Bro. Bag Co. is building a 200,000-square-foot plant at Houston, Tex., for manufacture of paper, textile and open-mesh bags. Completion is expected in late fall, and full operation is scheduled by the end of the year.

Highway Equipment Co. has named several distributors for its New Leader lime spreaders, combination lime and fertilizer spreaders, Widespread lime and fertilizer spreaders and Mobile Blenders. They are West Florida Equipment Co., Marianna, Fla.; Black Hawk Machinery, Inc., Cedar Falls, Iowa; and Nelson Trailer & Body Co., Inc., Rockford, Ill.

International Paper Co.'s "Gator-Ride" display told the "I-P packaging story" at the American Management Association's National Packaging Exposition in Chicago last month. When a visitor boards the "Gator-Ride" he is seated in a specially-designed lounge chair and helped to don headphones. From these, he hears the story of the papermaking process as the chair is slowly propelled via chain drive through a 40-foot tunnel lined with a series of transparencies showing the operation from woodlands to paper machines. Then the viewer is carried past three-dimensional displays of new products, packages and containers.

Owens-Illinois Glass Co.'s Multiwall Bag Div. has added three new sales representatives: Alvin L. Wistert was assigned to the western sales region with headquarters in Chicago, William E. Wehner, Jr., to a new sales territory

The Improved

FLEX-A-FOAM Dust Mask

Your best ounce of protection against

IRRITATING DUST

HERE'S WHY:

- **Workers wear it.** Lightweight (just 1 ounce), snug, comfortable and easy-to-breathe through, Flex-A-Foam is the one respirator your workers actually welcome.
- **It's super-efficient.** Flex-A-Foam's pure latex filter protects against nuisance dust particles 100 times smaller than the eye can see!
- **It's simple.** Only four sturdy, long-wearing parts — all interlocking — all unconditionally guaranteed.
- **And—it's economical.** Low first cost — less than any other quality respirator on the market. Low upkeep — washable filter outlasts throw-away type by more than 100 to 1!

Dust Protection Your Workers Will Welcome and Wear

Sample $1.45 postpaid industrial price only

FLEX-A-FOAM DUST MASK

FLEXO PRODUCTS, INC. • Westlake, Ohio

NOW

SPRAYING SYSTEMS

SPRAY NOZZLES

and related equipment

TeeJet Spray Nozzles —write for Catalog 30.

in brass, stainless steel, aluminum and Nylon to meet every farm spraying need

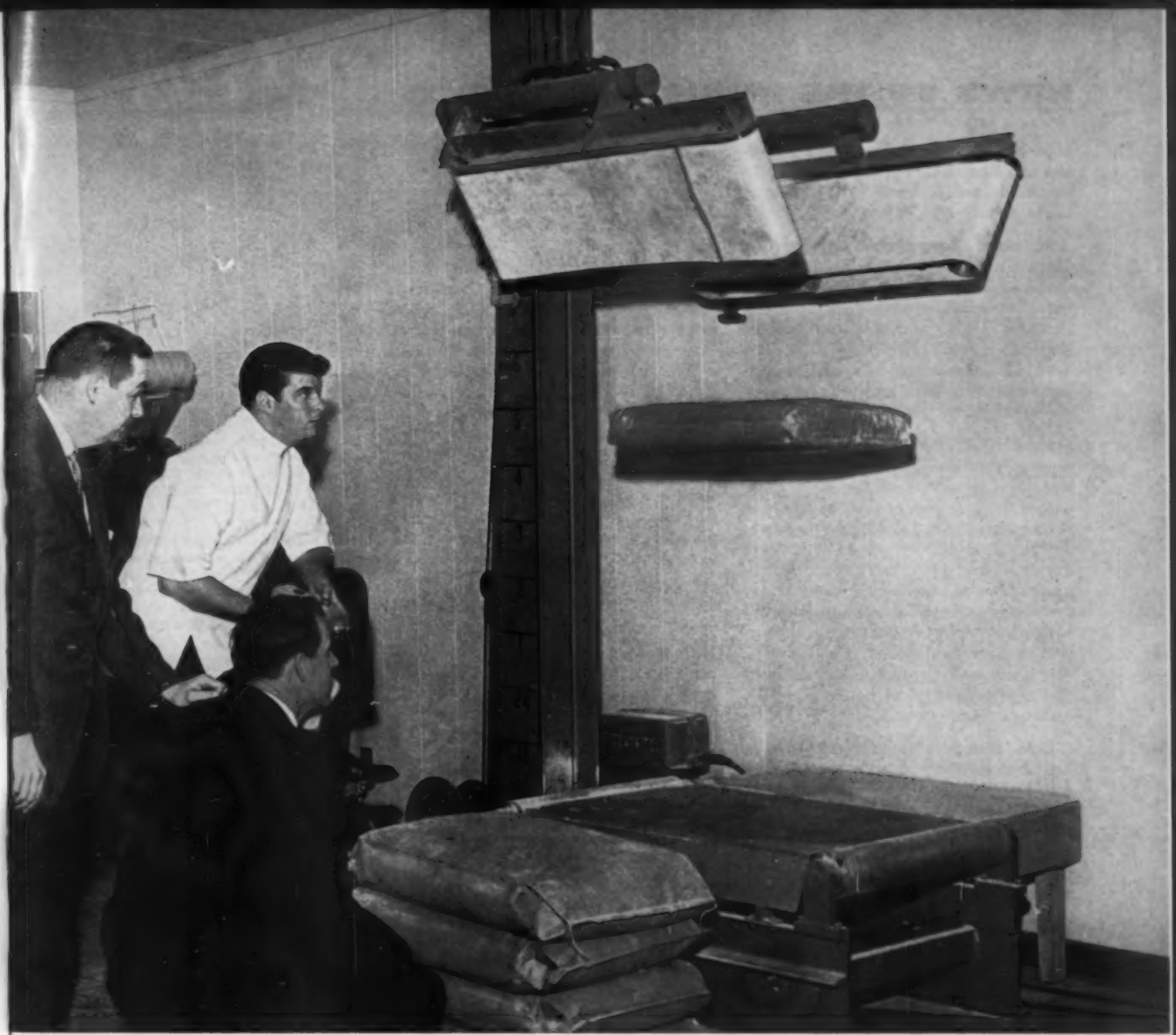
ACCESSORIES — a complete choice of line strainers, split-eyelet connectors, spray guns, nozzles and equipment for broadcast spraying, control valves, pressure relief valves and fittings.

DirectoValve with Nylon valve body supplied in one, two and three valve unit assemblies for selective spray control of booms and accessories. Write for Bulletin 100.

Diaphragm Pressure Relief Valve —write for Bulletin 101.

SPRAYING SYSTEMS CO.

3280 Randolph Street • Bellwood, Illinois



PROBLEM: How to get more strength in a moisture-resistant multiwall bag and save money too!

SOLUTION: International Paper's A-L Gator-Hide® Extensible Kraft multiwall is the strongest bag for your money.

INTERNATIONAL Paper, pioneers of asphalt-laminated multiwall bags, now offers you an amazing new paper—Asphalt-Laminated Gator-Hide Extensible Kraft.

Pound for pound, nothing on the market today excels this paper in both price and performance. You get a better bag than your present bag for less money. This adds up to real savings.

For instance, one fertilizer manufacturer realized savings of $4.30 per thousand bags on his multiwalls made with Asphalt-Laminated Gator-Hide Extensible Kraft. And he got a *stronger* bag in the bargain!

This remarkable new paper is a product of 63 years of papermaking and packaging experience. It is another example of the complete multiwall service offered to you by International Paper.

It will pay you to review your multiwall requirements with International Paper's Bagpak® packaging engineer. He has complete information. It's yours for the asking.

INTERNATIONAL PAPER

BAGPAK DIVISION • NEW YORK 17, N.Y.

covering southern Ohio, southern Indiana and Kentucky with headquarters in Louisville, and Kenneth J. LaMontagne to the eastern region in New York.

Raymond Bag Corp. reports that Jerry Agin and Al P. Wolff have joined the sales organization. Agin will work out of the Louisville office, covering southern Ohio, Indiana and eastern Kentucky, and Wolff will locate in New York City, contacting accounts in Metropolitan New York and the surrounding area.

Vulcan-Associated Container Companies, Inc. Presidents, vice presidents and sales managers of the seven companies met at the executive office in Birmingham, Ala., in March for a two-day managerial conference. Plans were discussed and projected for a stepped-up program of sales-service to container users and personalized cooperation by each plant with its customers and prospective container users. New products, new sales and promotional programs and a new concept of better plant coordination were presented.

Yale Materials Handling Div., The Yale & Towne Mfg. Co. Walter R. Saunders has been appointed north midwest regional manager, responsible for supervision of industrial lift truck and tractor shovel sales and service in a midwest area bounded on the south by Missouri and Kansas and on the north by central Canada. He will headquarter at 304 North Elmhurst Road, Prospect Heights, Ill.

Associations Meetings

Organization of state committees was announced by President Herbert Woodbury at a recent meeting of the **Midwest Agricultural Chemicals Association** in Omaha, Neb. Committee chairmen are: Nebraska—G. R. Brown, Miller Chemical Co.; Missouri—Howard W. Sheldon, Dow Chemical Co.; Iowa—G. A. Lawrence, Diamond Alkali Co.; Kansas—Robert S. Wise, Robert S. Wise Co., Inc.

A featured speaker at the Omaha meeting was Jack Dreessen, herbicide specialist for the National Agricultural Chemicals Association, who explained the operation of NAC and related the interests of his group with those of MACA. Lee Stirland, DuPont, was guest speaker at the luncheon meeting.

The tenth annual **Pesticide Chemicals School** at Clemson College, Clemson, S. C., February 28 and March 1, attracted more than 125 students. L. H. Moore of Ridge Chemicals, discussed "The Responsibility of the Dealer in Insecticides to the Customer." Gil Hibbard, manager of Taylor Chemical Co., of Inman, gave reasons for farmers' use of pesticides. A panel, presided over by Dr. W. M. Epps, head of Dept. of Botany and Bacteriology at Clemson, discussed pesticide applications and equipment. J. H. Cochran discussed "Recent Changes in the Academic Curricula in the School of Agriculture at Clemson."

Colorado fertilizer dealers and salesmen, county agents, soil conservation technicians and sugar beet fieldmen received instruction on soils and fertilizers at the recent Colorado Soil Fertility Training Sessions. Program leaders seated at the small table are, left to right, Duane Fountain, Phillips Petroleum Co.; Keith Campbell, Western Phosphates Inc., and H. J. "Bud" Hartman, Phillips Petroleum.

Five speakers featured at the 4th annual Arizona Fertilizer Conference held at the University of Arizona, Tucson, February 8 and 9 were E. O. Foster, Balfour, Guthrie & Co. Ltd. and chairman of the Soil Improvement Committee of Arizona Agricultural Chemicals Assn.; L. R. Hamilton, California Chemical Co.; Dr. Wallace Fuller, head, Dept. of Agricultural Chemistry and Soils, University of Arizona; Dr. Richard B. Bahme, Western Director, National Plant Food Institute, and Dr. C. O. Stanberry, USDA soil scientist, Tucson. More than 175 growers, fertilizer salesmen and technicians, and college specialists attended the conference.

More than 100 applicators, scientists and regulatory delegates from 21 states and Canada met February 14 and 15 in Chicago for the annual meeting of the **Aquatic Weed Society.**

An industrial panel discussed chemical compounds now being tested and marketed as possible aquatic herbicides. Panel members were Harrold B. Jones, American Smelting and Refining Co.; Cecil Kerr, Chipman Chemical Co.; Mark Wiltse, Dow Chemical Co.; James Flanagan, Geigy Chemical Co.; Charles Bolster, Pennsalt Chemical Co., and Lyle Hill, Reasor-Hill Chemical Co.

Continuous high attendance at the recent Colorado Soil Fertility Training Sessions testified to the high level of interest in gaining new knowledge of soils and fertilizer by fertilizer salesmen, county agents, soil conservation technicians and sugar beet fieldmen. About 50 of them attended each of the four two-hour sessions held at Sterling, Greeley, Ft. Morgan and Longmont, Colo.

Evaluation sheets were used to ob-

(Continued on page 56)

Important to

PESTICIDE FORMULATORS!

It's *results* that count when pesticides are applied for pest control . . . and the farmer is depending on *you* to use a carrier which GETS THE JOB DONE BEST!

For better Pesticidal Action . . . at no extra cost, use

CREEK-O-NITE CLAY

A 1960 test at the University of Wisconsin, against the *northern corn rootworm,* showed 3.5% corn lodging where ½-pound per acre of Heptachlor was used as a row treatment (involving 10% Heptachlor on 24/48 CREEK-O-NITE granules.) *Untreated* corn had 96.6% plant lodging in this experiment!

FOR PROMPT SERVICE AND IMMEDIATE DELIVERY
Phone Cassopolis, Michigan Collect
Hickory 5-2438

CREEK-O-NITE *is mined and processed by*
STAR ENTERPRISES, INC. OLMSTED, ILLINOIS
GENERAL OFFICES: CASSOPOLIS, MICHIGAN
IMMEDIATE DELIVERY! Write TODAY for samples and prices, without obligation.

READER SERVICE

FREE INFORMATION to help you solve fertilizer, pesticide problems

Chemicals

114—CLAY SAMPLES

Pesticide formulators will want to secure free samples of Creek-O-Nite clay, mined and processed by Star Enterprises, Inc. This high quality, lightweight montmorillionite clay comes in dust form for insecticide carriers and diluents; in granules for agriculture applications; and in fines for conditioning fertilizers. Creek-O-Nite clay gives better pesticidal action. To secure your free sample, just

CIRCLE 114 ON SERVICE CARD

115—CHEMICAL CATALOG

Hub States Chemical Co. has just published a new 56-page catalog of pesticides. This completely illustrated catalog has suggested mixing and application information. Bound in three sections—insecticides, rodenticides, and weed killers—the catalog enables the user to find specific chemicals with ease. You'll want to add this handy catalog to your library. For a copy simply

CIRCLE 115 ON SERVICE CARD

116—SPRAY ADJUVANTS

Wheat growers in the Pacific Northwest have demonstrated the necessity of using a spray adjuvant in their grain spraying programs. Colloidal Products Corporation has published a leaflet on their multi-film spray adjuvants. Improved Multi-Film L contains a highly refined, medium weight mineral oil, giving an oil-base application without the hazards of solutions containing low-grade, volatile petroleum oils. This factor is extremely important in diversified growing areas. In many cases, non-oil programs are desirable, particularly late in the season during warmer weather and lush growth. Under these conditions, Multi-Film X-77 has gained wide acceptance. To learn more about these spray adjuvants,

CIRCLE 116 ON SERVICE CARD

Process Equipment

117—TRANSFER PUMPS

Marine Products Company has released a new four-page brochure on their all-aluminum pumps for nitrogen solutions and all-iron pumps for liquid fertilizers. These MP pumps include such features as stainless steel drive sleeve, fittings, and lockwashers; ceramic shaft seal with carbon washer—self-adjusting type; self-priming with check valve to maintain prime; open adaptor construction which protects engine from solutions; and a shaft clamp which acts as a slinger and prevents solutions from entering engine. To add this brochure to your library,

CIRCLE 117 ON SERVICE CARD

118—GATE VALVE

DeZurik Corporation has recently re-designed their bonnetless knife gate valve. These valves are designed for tough services—corrosives, abrasive slurries, solids in suspension or air conveyed. They are the proved answer to these specified problems: valving solids, valving slurries, viscous materials. The bonnetless design eliminates a cavity which can fill with material and make operation of the valve difficult, if not impossible. The round-bottom gate eliminates corner cavities at the bottom of the valve. Solids cannot interfere with shut off; the gate is sharpened to shear through material trapped on the seat by descent of the gate. The body is cast, providing greater strength and more resistance to abrasion and corrosion. For an illustrated bulletin on DeZurik gate valves,

CIRCLE 118 ON SERVICE CARD

119—WEIGH FEEDERS

A new catalog on weight feeder machines has just been published by Syntron Company. Weigh feeders are designed for the accurate feeding of dry chemicals required in chemical processes. Included in the catalog is a section presenting data on Syntron batch weigh plants for accurate, automatic weighing of multiple batches of various materials, used when carefully weighed batches must be measured out to true proportions. To learn more about weight feeders, batch weigh plants, and weigh wheel gravimetric feeders, simply

CIRCLE 119 ON SERVICE CARD

Materials Handling

120—PAYLOADER

Manufacturers have found Payloader tractor-shovels, manufactured by Frank G. Hough Co., both efficient and dependable. The H-25 Payloader has a 2500-pound capacity, faster cycles and easier operation. Extra protection against dust and dirt has been built into the machine—cutting down costly repairs. Special air filtering and oil filtering and ample oil and grease seals make maintenance easy. The H-25 also features power-shift transmission and power steering. To learn how you can use the Payloader in your bulk handling,

CIRCLE 120 ON SERVICE CARD

121—NARROW AISLE TRUCKS

Have space problems? Then you'll want to learn more about the narrow aisle electric trucks and hydraulic hand pallet trucks manufactured by the Raymond Corporation. A 16-page book on these trucks has just been published. On-the-job photos show the wide variety of applications for this space saving equipment. Separate pages illustrate the various models available, including specifications. Of special interest is the new triple telescopic mast featured on Raymond trucks. For help in solving your space problems,

CIRCLE 121 ON SERVICE CARD

Packaging

122—BAG PRINTER

An attractively printed bag is a big help in selling any product. Why not consider adding color to your packaging? Schmultz Manufacturing Co., has a bag printer which is available in one, two, three and four colors for printing made up bags of paper, cotton and burlap. This versatile machine will print on new or used bags. To get complete information on how this bag printer can improve your package,

CIRCLE 122 ON SERVICE CARD

123—SINGLE WALL CONTAINER

West Virginia Pulp and Paper Company has just introduced a new bag-type container fabricated from heavy-duty Clupak extensible kraft paper. Balex features a versatility which makes it flexible enough for easy handling, yet stiff enough to shape up like a box for square and neater pallet loads. It has the conventional construction of a pasted bottom and open mouth and can be closed by either gluing or sewing. For additional details on this single wall container,

CIRCLE 123 ON SERVICE CARD

Application Equipment

124—SPRAY NOZZLES

Spraying Systems Co. has published a new catalog on their BoomJet and TeeJet spray nozzles for better, lower cost farm spraying. BoomJet nozzles are designed for broadcast spraying of grains and grasses, and the distribution of nitrogen solutions and related liquid fertilizers. TeeJet nozzles are precision built for uniform spray distribution and exact volume control. Most components are supplied in choice of brass, aluminum, stainless steel, and nylon for all spraying needs. For your copy of Catalog 30,

CIRCLE 124 ON SERVICE CARD

125—STAINLESS-CLAD STEEL

Are you applying farm chemicals? Then you'll want to learn more about Ingersoll stainless-clad steel tanks. Highly corrosive farm chemicals cannot attack the stainless steel lining made of Ingersoll IngAclad stainless-clad steel. Manufactured by Ingersoll Steel Division, Borg-Warner Corporation, IngAclad stainless-clad steel is priced approximately 28% less than solid stainless steel. Twenty per cent of the total sheet thickness is Ingersoll stainless steel. For a free sample of IngAclad steel and a copy of Ingersoll's facilities and products brochure, simply

CIRCLE 125 ON SERVICE CARD

See page 54 for information on these Reader Service Numbers:

126—Profit Lifters
127—Experience Counts
128—Bulk-O-Matic
129—Balanced and Automated

To use Reader Service Cards on pages 19 and 43: Circle number of literature you want. Print or type your name, position, company and address. Clip and mail.

Don't Miss This Chance!

Get these FC reprints to help you improve your sales organization.

Check reprints desired:

Salesense Series

- ☐ Sell to Dominant Buying Motive
- ☐ Knowledge Makes the Difference
- ☐ Plug up the Leaks in your Sales Plan
- ☐ Organize Your Time
- ☐ The Magic of Enthusiasm
- ☐ Don't Play with Price

Successful Selling Series

- ☐ Secrets of Persuasion
- ☐ 14 Ways to Definite Decisions
- ☐ Convince Your Prospect
- ☐ 18 Telephone Shortcuts
- ☐ What's In It For Me?
- ☐ Hidden Plusses
- ☐ Post Office Can Help Sell
- ☐ Pick Up New Business from Old Accounts
- ☐ Ask for the Order and Get It
- ☐ Beat the Competition . . . With Service
- ☐ Complaints into Sales
- ☐ Demonstrate with Showmanship

Credit Series

- ☐ The Credit Mess
- ☐ Cash Flow Chart Can Ease the Credit Strain
- ☐ Disorganization—A Problem
- ☐ Reaching the Middle Market
- ☐ Credit Training for Dealers

Miscellaneous Marketing

- ☐ Adapt Market Research to Sales Planning
- ☐ Dealer Meetings that Pay
- ☐ Publicity that Sells
- ☐ Merchandising Fertilizer
- ☐ Muscle in Your Marketing
- ☐ Farm Chemicals—Coming Into Their Own
- ☐ Clean Up Your Communications
- ☐ How to Figure Sales Potential
- ☐ Is Your Promotion Effective?
- ☐ Be a Constructive Critic of Your Present Marketing Program
- ☐ Build Sales Through Successful Farmer Meetings
- ☐ Creative Pricing
- ☐ Steps to Good Sales Meetings
- ☐ Obstacles to Marketing
- ☐ Sell A Mental Concept
- ☐ The Herbicide Market
- ☐ Purchasing Patterns for Pesticides
- ☐ How Do Your Dealers' Attitudes & Knowledge Rate?

Reprints 50 cents per copy.

FARM CHEMICALS
Willoughby, Ohio

Enclosed is my check for $.....

Name.....

Title.....

Address.....

City..... Zone.... State....

NEW & NOTEWORTHY

PROFIT LIFTERS

In our March issue, we discussed many new developments in bulk handling and storage of dry bulk fertilizer.

To take profitable advantage of this method, lift trucks are essential. Yale Materials Handling Division of Yale & Towne Manufacturing Company has designed a lift truck which incorporates heavy dust protection to reduce maintenance and lengthen engine life where atmospheric contamination is very severe.

In place of the dual air filter arrangement in standard dust protection modifications, the heavy duty system provides a triple filtering process: dry type precleaner, oil bath cleaner and a final dry type filter. Complete information will be sent to you right away if you will

CIRCLE 126 ON SERVICE CARD

EXPERIENCE COUNTS

In the commercial fruit and vegetable industry we have seen actual grower proof of the importance of trace elements. Growers like Ferro Agricultural FTE (fritted trace elements). They are acquainted with the product and experi-

ence has proven its worth. You'll be delivering a better product which will do more for the farmer. All the facts about FTE will be sent your way if you will

CIRCLE 127 ON SERVICE CARD

BULK-O-MATIC

Fertilizer companies save many man hours when they incorporate bulk handling in their operation. Bag costs and breakage are also eliminated.

The Phillips Chemical Company in Lawrence, Kan., is using the Butler Bulk-O-Matic tanks with epoxy linings for its new ammonium nitrate blending

station. The tanks hold approximately 70 tons of product. Full details will be sent your way if you will

CIRCLE 128 ON SERVICE CARD

BALANCED AND AUTOMATED

Out in Kansas a new liquid fertilizer plant is in full swing. This new plant produces 15 tons per hour of 8-24-0 with a new continuous process. Excellent quality control plus high production at a low investment has made the plant there twice as effective.

In addition, Agricultural Business Company, Inc. has just installed a new

agri-blend granular fertilizer plant for the blending of dry fertilizer materials. The new plant stores four or more granular fertilizer materials in Butler Bulk-O-Matic tanks which have capacity up to 200 tons per bin. To learn more about this unusual plant,

CIRCLE 129 ON SERVICE CARD

Presenting

THE MOST MODERN BAG PRINTER

Manufactured in
One, Two, Three and Four Colors for printing made up bags of Paper, Cotton and Burlap, new and used.

Let us send you complete information with descriptive literature.

SCHMUTZ
MFG. CO.
18th and Main Streets
Zone 3
Louisville, Ky.

Cable Address "SCHMUTZ"—Long Distance Phone CLAY 7771

MANUFACTURERS OF
SODIUM ARSENITE SOLUTIONS

READE MFG. CO. INC.
130 Hoboken Avenue
JERSEY CITY 2, N. J.

PLANTS: JERSEY CITY, N. J., CHICAGO, ILL., N. KANSAS CITY, MO., BIRMINGHAM, ALA., TEXARKANA, ARK.

FOR SALE

4—2250 gal. T316 Stainless tanks.
5—Shriver 48" C.I. filter presses.
4—Ing.-Rand 6" x 5" 316 st. st. pumps.
6—Valley 36" Aluminum filter presses.
1—Worthington 70 cu. ft. rot. batch blender.
1—Raymond 66" 6-roll mill, rebuilt.
2—Raymond 50" 5-roller hi-side mills.
2—Davenport 8' x 60' rot. dryers, 7/16" welded.
1—7'-6" x 62' rotary cooler, 1/2" welded.
2—Bonnet 7' x 60' rot. dryers, 5/8" shell.
2—Bonnet 6' x 52' rotary dryers.
1—Louisville 5' x 25' steam-tube dryer.
1—Louisville 4'-6" x 25' steam-tube dryer.
1—Standard 3' x 23' rotary dryer.
2—18,000 gal. vert. alum. tanks.

LARGEST STOCK OF ROTARY DRYERS & COOLERS

PERRY EQUIPMENT CORPORATION
1430 N. 6th St., Phila. 22, Pa. POplar 3-3505

LIQUIDATING alcohol mfg. & grain processing plant at Omaha, Neb. Stills, dryers, filters, presses roller & hammermills, pumps, etc. Send for circular. Perry, 1430 N. 6th St., Phila. 22, Pa.

LARGE CHEMICAL COMPANY supplying plant foods, pesticides and feed additives needs salesmen with 3-8 years selling experience in one or more of these areas. B.S. degree in agriculture, chemistry or chemical engineering preferred. Send resume to **W. R. Hayes, Monsanto Chemical Company, Agricultural Chemicals Division, St. Louis 66, Missouri.**

FOR YOUR CONVENIENCE

FARM CHEMICALS is now being published by AMERICAN FRUIT GROWER PUBLISHING COMPANY, Willoughby, Ohio. For prompt response, please address your correspondence, change of address or matters pertaining to your subscription to—

FARM CHEMICALS
Willoughby, Ohio

New Frontiers . . .

(Continued from page 41)

have already established that the following weeds can be controlled with Aquathol:

Common Name	Latin Name
Horned Pondweed	*Zannichellia spp.*
Coontail	*Ceratophyllum spp.*
Water Stargrass	*Heteranthera spp.*
Milfoil	*Myriophyllum spp.*
Bushy Pondweed	*Najas spp.*
	Potamogeton americanus
Bassweed	*Potamogeton amplifolius*
Curly Leaf Pondweed	*Potamogeton crispus*
	Potamogeton diversifolius
	Potamogeton filiformis
Floating-Leaf Pondweed	*Potamogeton natans*
	Potamogeton pusillus
Sago Pondweed	*Potamogeton pectinatus*
Flat-Stem Pondweed	*Potamogeton zosteriformis*
Burr Weed	*Sparganium spp.*
Duckweed	*Wolffia, Spirodela, Lemna, spp.*

Residue problems in water treated with Aquathol are practically non-existent. This was shown by Drs. V. H. Freed and Illo Gauditz in a paper which was presented before the Northeast Weed Control Conference in 1961. Their studies showed that this chemical rapidly breaks down both in fish and in water which has weeds and sediment high in organic material present. Radioactive tracer studies, they reported, indicated that the endothal structure is largely degradated in less than 3 days in the body of the fish. Table II illustrates the rapid disappearance of the endothal in water where soil and weeds are present. Both fish and water can be safely used after 7 days for any purpose. Fish can be used for food purposes in only three days after treatment.

TABLE II*
Disappearance of Aquathol from Water in Weed-infested Lake. Treated with 3 ppm

Time after Treatment	Aquathol Found
0.5 hour	2.5 ppm
1.0 hour	1.5 ppm
1.5 hour	1.0 ppm
2.5 hour	.7 ppm
48 hour	0.4 ppm
196 hour	less than 0.4 ppm

Since Aquathol has been found to control many of the common aquatic weeds at doses varying from 1 to 3 parts per million it is apparent, therefore, that this material can be used without danger of toxicity in lakes and ponds. Irrigation ditch treatments can be made where the water is held 7 days before application to a crop.

Aquathol now is available commercially in two forms: a liquid containing 19.2% active ingredient, and a 5% granular preparation. It can be sprayed on, as well as being applied below, the water. The granular formula may be applied either by hand or with any of the various types of hand seed spreaders.

Aquathol is not recommended for use in rapidly flowing waters. Some derivatives of the basic endothal have shown favorable indications in tests in weed control in fast flowing streams, but these are still in the experimental stage and the product is not recommended for such use.

Aside from the simple, common sense precautions recommended on the label, only this further warning is offered in connection with the use of Aquathol. Where bodies of water containing fish are heavily infested with weeds, it is not wise to try to treat the entire body of water at one time. The large mass of decaying vegetation may deplete the oxygen from the water. In such cases, it is better to divide the lake into several areas, and treat these one at a time as a precaution to avoid oxygen depletion which would be detrimental to marine life. ☆

**From data developed by Dr. Robert C. Hiltibran, Association Biochemist, Illinois State Natural History Survey, Urbana, Illinois and whose article is in press.*

Associations & Meetings

(Continued from page 52)

tain attendees reactions to the sessions. Subjects mentioned often as being most desirable were physical and chemical properties of soils, soils as an environment for plant growth, use of soil test information and plant analysis and calculating the use of chemical fertilizers.

"These pilot sessions were so well attended that additional schools have been requested next year for other sections of Colorado," reports Dr. Richard B. Bahme, western director of the National Plant Food Institute.

California Fertilizer Association's Soil Improvement Committee has awarded six scholarships to California State College students of soil science, crop production, chemistry, animal husbandry and related subjects.

The $100 scholarships went to Thomas Banko and Allen Bruner, Calpoly, Pomona; Carl J. Rheingans and Dale R. Wood, Cal-poly, San Luis Obispo; Ronald S. Peterson, Fresno State College, and Morris Ball, Chico State College.

Agricultural Ammonia Institute reports that response to its new book, "Anhydrous Ammonia Handbook for American Agriculture" has been exceedingly gratifying. Written in layman's language, the book contains 100 pages and more than 130 illustrations.

MONARCH SPRAYS

This is our Fig. 645 Nozzle. Used for Scrubbing Acid Phosphate Gases. Made for "full" or "hollow" cone in brass and "Everdur." We also make "Non-Clog" Nozzles in Brass and Steel, and

Stoneware Chamber Sprays

now used by nearly all chamber spray sulphuric acid plants.

CATALOG I

MONARCH MFG. WORKS, INC.
2501 East Ontario Street, Philadelphia 34, Pa.

SHUEY & COMPANY, Inc.

Specialty: Analysis of Fertilizer Materials and Phosphate Rock. Official Chemists for the Phosphate Industry. Official Weigher and Sampler for the National Cottonseed Products Association at Savannah; also Official Chemists for National Cottonseed Products Association.

115 E. BAY STREET, SAVANNAH, GA.

FARM CHEMICALS HANDBOOK

Standard Reference Guide for the Farm Chemicals Industry
Write today to

FARM CHEMICALS HANDBOOK
37841 Euclid Ave. Willoughby, Ohio

ORDER NOW! 1961 SPRAY COMPATIBILITY CHART

Larger and completely revised for 1961. This chart tells at a glance just what chemicals mix safely.

50c

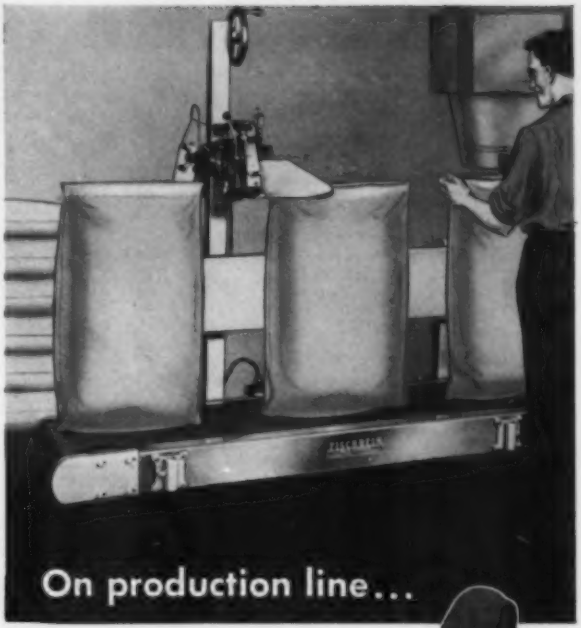
Don't forget our important Companion Spray Safety Chart.

50c

Order both charts
— a $1.00 value — for only 75c.
Quantity prices on request.

This offer good only in U. S. A. and Canada. Coin or money order must accompany each order.

FARM CHEMICALS
Willoughby, Ohio
Enclosed is money or my check. Send ..... compatibility charts and/or ..... companion spray safety charts to:
Name .....
Address .....
City ..... State .....



On production line...

or one at a time...

FISCHBEIN®

BAG CLOSING EQUIPMENT

saves time and money!

For fast, secure closing of bags in any production application, you can depend on efficient, low cost FISCHBEIN BAG CLOSING EQUIPMENT . . . a complete line ranging from completely portable to fully automatic production line machines. Fischbein equipment performs reliably on all kinds of textile or paper bags.

DAVE FISCHBEIN CO. DEPT. GE
2720 30th Avenue S., Minneapolis 6, Minn., USA

Send coupon for complete catalog file of FISCHBEIN Bag Closing Equipment.

Name _____
Firm _____
Address _____
City _____ Zone ____ State _____

It's a free country!

There are some things that are better left *unsaid* by an editor. On this score, we were amused by Herbert A. Leggett's remarks in the Valley National Bank's "Arizona Progress."

In the March issue of the Phoenix bank's popular publication, Leggett reported:

"*. . . don't let anyone confuse you with statistics —or logic. Both are obsolete. Economics is one field where the less you know the better. A little knowledge is dangerous, as the poet said, but a lot of knowledge may be downright disastrous.*"

Being one who prefers to have the odds more in his favor, the writer would like to turn the matter of the *business side* of the farm chemicals picture over to a couple of experts who don't scare easily.

We'll start with the swashbuckling vice president in charge of sales for International Minerals & Chemical Corporation, Len Gopp. We interviewed him in connection with this month's marketing feature on page 12, "How to Make Sales Today."

Q. Mr. Gopp, what effect will the present recession have on fertilizer sales this year?

A. "The recent recession has had no influence on our business. More than that there is no indication that any of the recessions since World War II have had any effect on the fertilizer business.

"The fact that the fertilizer business is not related to the general business cycle is clearly evident from an inspection of the industrial production index in comparison with the growth in fertilizer nutrients.

"Ups and downs in industrial production do not coincide with changes in fertilizer nutrient consumption. Fertilizer consumption shows a steady uptrend while industrial production shows substantial ups and downs."

R. W. Yoder, pesticide products manager of the agricultural division of American Cyanamid Company, had some similar remarks to make about the pesticide market in his talk before the Commercial Chemical Development Association in New York City in March.

"Department of Agriculture estimates now predict a 20 per cent rise in pesticide use by the mid-1960's," he said. "During the past twenty years, pesticide business has grown 7 times. During the next twenty years? I predict a tenfold increase."

Q. How quickly is a new practice accepted?

A. "The answer would amaze you. In 1960 in Iowa, 67 per cent more corn was treated with soil insecticides than in 1959. But the picture isn't consistent. There *are* some lags. And those lags are our opportunities. In a recent survey on corn, it was estimated one half of the corn acreage receives no chemical herbicides. There is *still* a large undeveloped market . . .

"Change habits . . . and change the market. Ever since the appearance of dry granular forms of pesticides, their popularity grows. We look for continued growth. Another new practice . . . mixing fertilizers with herbicides . . . should increase herbicide sales.

Q. What about Government control programs?

A. "This is definitely a plus factor . . . experience backs that point. When a farmer is told he can't use half his farm, what does he do? He makes the other half work twice as hard! *More* fertilizer . . . *more* pesticides . . . *more* cultivation . . . *more* care . . . and the land just naturally responds!

"And in the background is the vision of new things to come . . . new chemicals to control pests more efficiently . . . new versatile chemicals to replace those with limited use . . . Research and development is the key to this . . . The cost of development of a single chemical . . . now over one million dollars . . . can be recovered by stressing versatility.

"During the past twenty years, pesticide business has grown 7 times. During the next twenty years? . . . I predict a tenfold increase.

"And why? . . . Because agriculture has increased its productive capacity many times by using pesticides. Only by increasing its use of pesticides will it increase productive capacity to meet the demands and needs of consumers in an expanding population. Estimates of crop losses from uncontrolled pests total 9 billion dollars annually. A sales volume of only 290 million dollars of pesticides hardly scratches the surface of the need that exists. The Department of Defense may have its missile gap, but American agriculture has its pest control gap!"

A final thought. Going along with my earlier premise that some things are better left unsaid, in our March editorial we had two experts lined up squarely against each other as far as their philosophies on modern merchandising techniques—and for that matter, the American Way of doing business—were concerned. On one side was Vance Packard, who's "agin" our present distribution system and on the other side was "Stu" Bear of Niagara Chemical Division, Food Machinery & Chemical Corporation—a champion of the modern marketing concept.

"Stu" later informed me that "Vance Packard happens to be my brother-in-law"!

Gordon L. Berg

EDITOR

EXTENSIBLE CLUPAK® PAPER*

MULTIWALL BAGS OUT-PERFORM CONVENTIONAL KRAFT IN THE 3 TOUGHEST TESTS IN PACKAGING TODAY!

1 In Handling And In Transit!

CLUPAK extensible paper introduces a new dimension to multiwall bag performance: the ability to *stretch under strain.* When subjected to truck and box car manhandling which often destroys ordinary bags, these tougher multiwalls arrive intact, thus reducing product waste and damage. Order a trial shipment of CLUPAK extensible paper multiwalls – see how they outperform conventional bags of higher basis weight.

2 In The Warehouse!

New CLUPAK extensible paper reduces waste – even saves space – in your warehouse! That's because impact and strain which destroy conventional kraft are *absorbed* by multiwalls made from stretchable, flexible CLUPAK extensible paper. They can be stacked higher, shifted faster, and handled rougher than ordinary bags – with little danger of splitting or bursting. This extra toughness enables you to use multiwalls of lower basis weight – another saving!

3 On The Filling Line!

Two major filling line problems, breakage and uneven filling, are substantially eliminated by multiwalls made from CLUPAK extensible paper. Remarkably flexible, they fill quickly and uniformly. And because these tougher multiwalls have greater impact strength – the ability to *absorb* shock – they resist rough treatment that tears conventional bags. Breakage is reduced, repackaging minimized, production speeded! Try multiwalls made from CLUPAK extensible paper, soon!

Prior to CLUPAK extensible paper, there were no controlled standards of toughness in the paper industry. Clupak, Inc., is proud to have established these standards and permits the use of its trademark only on paper which meets these rigid toughness requirements.

EXTENSIBLE CLUPAK® PAPER

Ask your salesman about this revolutionary new material... prove to yourself that multiwall bags made of CLUPAK extensible paper give you...

GREATER STRENGTH WITH LOWER TOTAL BASIS WEIGHT

*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N.Y. 36, N.Y.

a complete line of

ORGANICS & CONDITIONERS

for the fertilizer industry

Free samples and data gladly supplied on request

No matter what your needs are – organics, conditioners, nitrogen, potash, or sulphur – Ashcraft-Wilkinson can simplify your procurement problems. We keep tab on materials from hundreds of sources throughout the world. One call to us is all that's necessary.

ASHCRAFT-WILKINSON COMPANY Atlanta, Georgia

District Offices: NORFOLK, VA. • CHARLESTON, S. C. • TAMPA, FLA. • JACKSON, MISS. • COLUMBUS, OHIO • MONTGOMERY, ALA. • DES MOINES, IOWA